Australia's National Science Agency

Australian Government

National Water Grid

Regulatory considerations and approval steps required for land and water development in the Roper catchment

A technical report from the CSIRO Roper River Water Resource Assessment for the National Water Grid

Thomas Vanderbyl (Badu Advisory Pty Ltd)

badu advisory
water + environment

ISBN 978-1-4863-1907-7 (print)

ISBN 978-1-4863-1908-4 (online)

Citation

Vanderbyl T (2023) Regulatory considerations and approval steps required for land and water development in the Roper catchment. A technical report from the CSIRO Roper River Water Resource Assessment for the National Water Grid. CSIRO, Australia.

Copyright

Important disclaimer

CSIRO Roper River Water Resource Assessment acknowledgements

This report was funded through the National Water Grid's Science Program, which sits within the Australian Government's Department of Climate Change, Energy, the Environment and Water.

Aspects of the Assessment have been undertaken in conjunction with the Northern Territory Government.

The Assessment was guided by two committees:

i. The Assessment's Governance Committee: CRC for Northern Australia/James Cook University; CSIRO; National Water Grid (Department of Climate Change, Energy, the Environment and Water); NT Department of Environment, Parks and Water Security; NT Department of Industry, Tourism and Trade; Office of Northern Australia; Qld Department of Agriculture and Fisheries; Qld Department of Regional Development, Manufacturing and Water

ii. The Assessment's joint Roper and Victoria River catchments Steering Committee: Amateur Fishermen's Association of the NT; Austrade; Centrefarm; CSIRO, National Water Grid (Department of Climate Change, Energy, the Environment and Water); Northern Land Council; NT Cattlemen's Association; NT Department of Environment, Parks Australia; Parks and Water Security; NT Department of Industry, Tourism and Trade; Regional Development Australia; NT Farmers; NT Seafood Council; Office of Northern Australia; Roper Gulf Regional Council Shire

Responsibility for the Assessment's content lies with CSIRO. The Assessment's committees did not have an opportunity to review the Assessment results or outputs prior to its release.

This report was reviewed by Dr Ian Watson (CSIRO) and Dr Cuan Petheram (CSIRO).

Acknowledgement of Country

CSIRO acknowledges the Traditional Owners of the lands, seas and waters, of the area that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present.

Photo

Roper River, Northern Territory. Source: CSIRO – Nathan Dyer

Director's foreword

Sustainable regional development is a priority for the Australian and Northern Territory governments. Across northern Australia, however, there is a scarcity of scientific information on land and water resources to complement local information held by Indigenous owners and landholders.

Sustainable regional development requires knowledge of the scale, nature, location and distribution of the likely environmental, social and economic opportunities and the risks of any proposed development. Especially where resource use is contested, this knowledge informs the consultation and planning that underpins the resource security required to unlock investment.

In 2019 the Australian Government commissioned CSIRO to complete the Roper River Water Resource Assessment. In response, CSIRO accessed expertise and collaborations from across Australia to provide data and insight to support consideration of the use of land and water resources for development in the Roper catchment. While the Assessment focuses mainly on the potential for agriculture, the detailed information provided on land and water resources, their potential uses and the impacts of those uses are relevant to a wider range of regional-scale planning considerations by Indigenous owners, landholders, citizens, investors, local government, the Northern Territory and federal governments.

Importantly the Assessment will not recommend one development over another, nor assume any particular development pathway. It provides a range of possibilities and the information required to interpret them - including risks that may attend any opportunities - consistent with regional values and aspirations.

All data and reports produced by the Assessment will be publicly available.

Chris Chilcott

Project Director

The Roper River Water Resource Assessment Team

Project Director	Chris Chilcott
Project Leaders	Cuan Petheram, Ian Watson
Project Support	Caroline Bruce
Communications	Chanel Koeleman/Kate Cranney, Siobhan Duffy, Amy Edwards

Activities

Agriculture and socio-economics	Chris Stokes, Caroline Bruce, Shokhrukh Jalilov, Diane Jarvis[1], Adam Liedloff, Yvette Oliver, Alex Peachey[2], Allan Peake, Maxine Piggott, Perry Poulton, Di Prestwidge, Thomas Vanderbyl[7], Tony Webster, Steve Yeates
Climate	David McJannet, Lynn Seo
Ecology	Danial Stratford, Laura Blaney, Rik Buckworth, Pascal Castellazzi, Bayley Costin, Roy Aijun Deng, Ruan Gannon, Sophie Gilbey, Rob Kenyon, Darran King, Keller Kopf[3], Stacey Kopf[3], Simon Linke, Heather McGinness, Linda Merrin, Colton Perna[3], Eva Plaganyi, Rocio Ponce Reyes, Jodie Pritchard, Nathan Waltham[9]
Groundwater hydrology	Andrew R. Taylor, Karen Barry, Russell Crosbie, Phil Davies, Alec Deslandes, Katelyn Dooley, Clement Duvert[8], Geoff Hodgson, Lindsay Hutley[8], Anthony Knapton[4], Sebastien Lamontagne, Steven Tickell[5], Sarah Marshall, Axel Suckow, Chris Turnadge
Indigenous water values, rights, interests and development goals	Pethie Lyons, Marcus Barber, Peta Braedon, Kristina Fisher, Petina Pert
Land suitability	Ian Watson, Jenet Austin, Elisabeth Bui, Bart Edmeades[5], John Gallant, Linda Gregory, Jason Hill[5], Seonaid Philip, Ross Searle, Uta Stockmann, Mark Thomas, Francis Wait[5], Peter L. Wilson, Peter R. Wilson
Surface water hydrology	Justin Hughes, Shaun Kim, Steve Marvanek, Catherine Ticehurst, Biao Wang
Surface water storage	Cuan Petheram, Fred Baynes[6], Kevin Devlin[7], Arthur Read, Lee Rogers, Ang Yang,

Note: Assessment team as at June 15, 2023. All contributors are affiliated with CSIRO unless indicated otherwise. Activity Leaders are underlined.

[1]James Cook University; [2]NT Department of Industry, Tourism and Trade; [3] Research Institute for the Environment and Livelihoods. College of Engineering, IT & Environment. Charles Darwin University; [4]CloudGMS; [5]NT Department of Environment, Parks and Water Security; [6]Baynes Geologic; [7]independent consultant; [8]Charles Darwin University[9]Centre for Tropical Water and Aquatic Ecosystem Research. James Cook University.

Shortened forms

SHORT FORM	FULL FORM
ALRA NT	*Aboriginal Land Rights (Northern Territory) Act 1976*
ALT	Aboriginal Land Trust
CLC	Central Land Council
DEPWS	Department of Environment, Parks and Water Security
EIA	environmental impact assessment
EMP	environment management plan
GDE	groundwater-dependent ecosystems
ILUA	Indigenous Land Use Agreement
NLC	Northern Land Council
NPU	non-pastoral use
NT	Northern Territory
NT EPA	Northern Territory Environment Protection Authority
PLB	Pastoral Land Board
PLC	pastoral land clearing
SWR	Strategic Aboriginal Water Reserve
WDL	waste discharge licence

Units

UNIT	DESCRIPTION
ha	hectare
km	kilometre
km^2	square kilometre
ML	megalitre
ML/year	megalitres per year (ML/y)
t	tonne
tCO_2e	tonnes (t) of carbon dioxide (CO_2) equivalent (e)

Preface

Sustainable regional development is a priority for the Australian and Northern Territory governments. For example, in 2023 the Northern Territory Government committed to the implementation of a new Territory Water Plan. One of the priority actions announced by the government was the acceleration of the existing water science program 'to support best practice water resource management and sustainable development'.

The efficient use of Australia's natural resources by food producers and processors requires a good understanding of soil, water and energy resources so they can be managed sustainably. Finely tuned strategic planning will be required to ensure that investment and government expenditure on development are soundly targeted and designed. Northern Australia presents a globally unique opportunity (a greenfield development opportunity in a first-world country) to strategically consider and plan development. Northern Australia also contains ecological and cultural assets of high value and decisions about development will need to be made within that context. Good information is critical to these decisions.

Most of northern Australia's land and water resources, however, have not been mapped in sufficient detail to provide for reliable resource allocation, mitigate investment or environmental risks, or build policy settings that can support decisions. Better data are required to inform decisions on private investment and government expenditure, to account for intersections between existing and potential resource users, and to ensure that net development benefits are maximised.

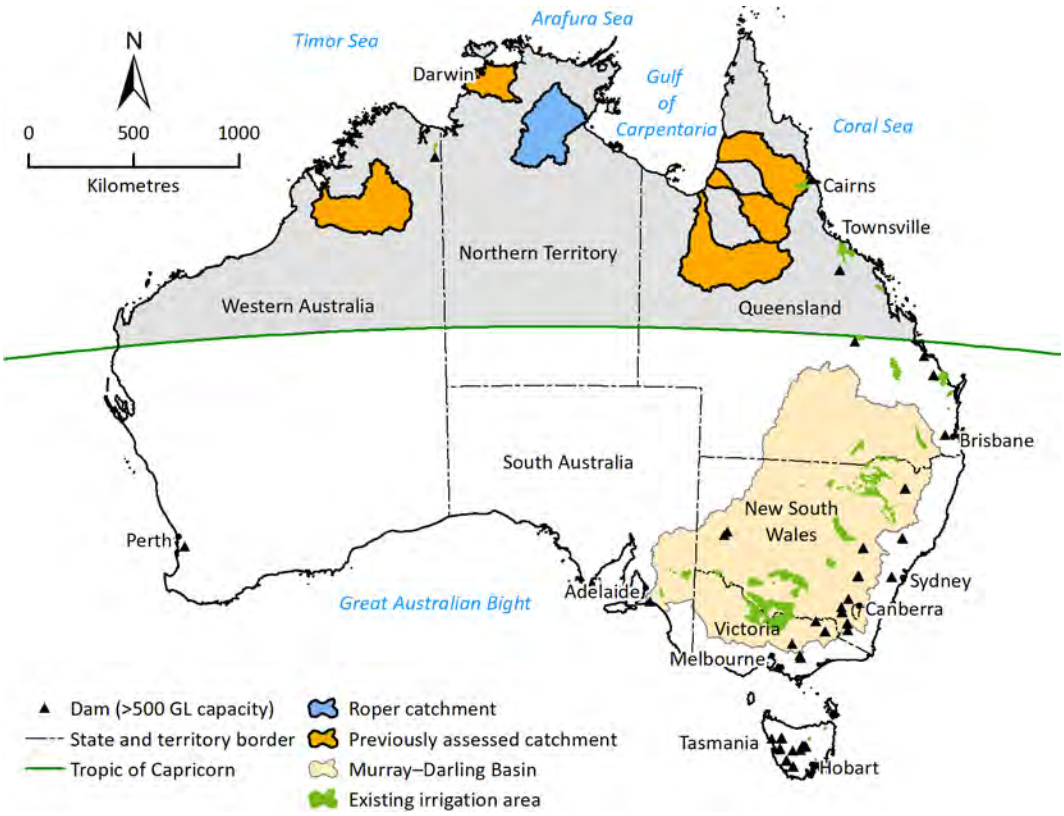
In consultation with the Northern Territory Government, the Australian Government prioritised the catchment of the Roper River for investigation (Preface Figure 1-1) and establishment of baseline information on soil, water and the environment.

Northern Australia is defined as the part of Australia north of the Tropic of Capricorn. The Murray–Darling Basin and major irrigation areas and major dams (greater than 500 GL capacity) in Australia are shown for context.

The Roper River Water Resource Assessment (the Assessment) provides a comprehensive and integrated evaluation of the feasibility, economic viability and sustainability of water and agricultural development.

While agricultural developments are the primary focus of the Assessment, it also considers opportunities for and intersections between other types of water-dependent development. For example, the Assessment explores the nature, scale, location and impacts of developments relating to industrial and urban development and aquaculture, in relevant locations.

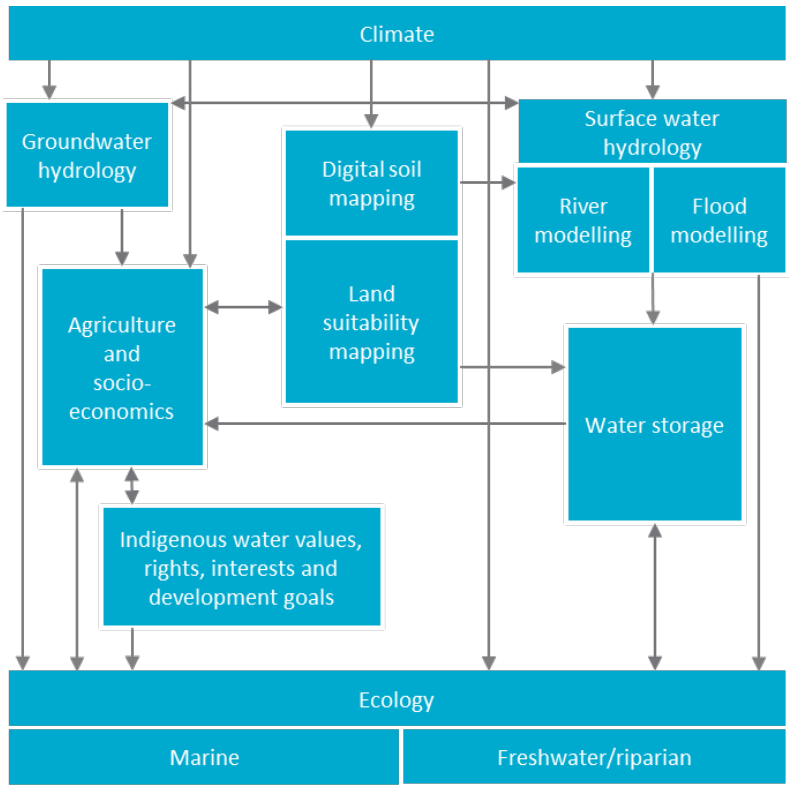
The Assessment was designed to inform consideration of development, not to enable any particular development to occur. As such, the Assessment informs – but does not seek to replace – existing planning, regulatory or approval processes. Importantly, the Assessment does not assume a given policy or regulatory environment. As policy and regulations can change, this enables the results to be applied to the widest range of uses for the longest possible time frame.



Preface Figure 1-1 Map of Australia showing Assessment area

It was not the intention – and nor was it possible – for the Assessment to generate new information on all topics related to water and irrigation development in northern Australia. Topics not directly examined in the Assessment are discussed with reference to and in the context of the existing literature.

Functionally, the Assessment adopted an activities-based approach (reflected in the content and structure of the outputs and products), comprising eight activity groups; each contributes its part to create a cohesive picture of regional development opportunities, costs and benefits. Preface Figure 1-2 illustrates the high-level links between the eight activities and the general flow of information in the Assessment.



Preface Figure 1-2 Schematic diagram of the high-level linkages between the eight activities and the general flow of information in the Assessment.

Assessment reporting structure

Development opportunities and their impacts are frequently highly interdependent and consequently, so is the research undertaken through this Assessment. While each report may be read as a stand-alone document, the suite of reports most reliably informs discussion and decisions concerning regional development when read as a whole.

The Assessment has produced a series of cascading reports and information products:

- Technical reports; that present scientific work at a level of detail sufficient for technical and scientific experts to reproduce the work. Each of the eight activities has one or more corresponding technical report.
- A Catchment report; that for the Roper catchment synthesises key material from the technical reports, providing well-informed (but not necessarily-scientifically trained) readers with the information required to make decisions about the opportunities, costs and benefits associated with irrigated agriculture and other development options.
- A Summary report; that for the Roper catchment provides a summary and narrative for a general public audience in plain English.
- A Summary factsheet; that for the Roper catchment provides key findings for a general public audience in the shortest possible format.

The Assessment has also developed online information products to enable the reader to better access information that is not readily available in a static form. All of these reports, information tools and data products are available online at https://www.csiro.au/roperriver. The website provides readers with a communications suite including factsheets, multimedia content, FAQs, reports and links to other related sites, particularly about other research in northern Australia.

Contents

Figures

Regulatory considerations and approval steps required for land and water development in the Roper catchment

The key question that this activity seeks to address in the Roper catchment is:

- What is the suite of regulatory considerations and approvals that apply to land and water development proposals in the Northern Territory and specifically to the Roper catchment?

1 Summary

At first glance, potential investors might form the impression that as land and water resources in the Northern Territory (NT) of Australia are relatively plentiful, the opportunity exists for their speedy and unconstrained development.

This case study illustrates how NT's natural resources are allocated and managed via the application of a suite of regulatory arrangements and requirements. Investors must navigate these when seeking to secure access to, and develop, land and water resources in the NT.

The case study draws extensively from a diverse range of valuable information published by the Northern Territory Government and other sources. It aims to organise and present information about NT's land and water regulatory and approvals landscape in a systematic manner. It is designed to serve as a valuable introductory resource for those interested in advancing new developments in the NT (with a particular focus on the Roper catchment).

Certain aspects, such as environmental assessment requirements, covered in this study may be familiar to individuals who have been involved in developments in other Australian states. However, the regulatory framework in the NT also includes some unique features (like Aboriginal freehold land) as well as some aspects (such as the implications of native title for pastoral leasehold land) that are more prevalent in the NT than in other states.

The case study also examines how the regulatory requirements and instruments apply in the catchment of the Roper River to complement and inform CSIRO's comprehensive and integrated evaluation of the feasibility, economic viability and sustainability of water resource development in that catchment. For example, in the Roper catchment, which is comprised of complex systems of braided streams, retaining a buffer of native vegetation adjacent to waterways and wetlands is likely to materially reduce the area of land allowed to be cleared.

The NT planning context coupled with the characteristics of the Roper catchment's physical environment are likely to have an important bearing on the way that regulatory assessment processes are implemented, and land and water development decisions are made.

In particular, rivers in the Roper catchment are highly ephemeral in nature compared to existing water supply systems located in southern states. It is important that this characteristic, coupled with NT's evolving wet-season surface water policy response, are taken into account by project proponents when planning their development proposals.

There are three water allocation plans in various stages of development that intersect with the Roper catchment: the Georgina Wiso Water Allocation Plan, the Mataranka Tindall Limestone Aquifer Water Allocation Plan (in progress) and the Flora Tindall Limestone Aquifer Water Allocation Plan (in progress). Proponents of developments in those parts of the Roper that intersect with these plan areas need to be aware of the provisions that will, once approved, effectively define the availability of specific surface and groundwater resources.

An important foundation of the NT's regulatory landscape is the unique mix of land tenure types that exist compared with other Australian jurisdictions. About 50% of NT land area is Aboriginal freehold, 49% is pastoral lease (which is subject to native title) and the remaining 1% is freehold

that is not Aboriginal land. In the Roper catchment, 45% of the area is Aboriginal freehold land and 6% is national park. Aboriginal freehold land is unique to the NT. These land tenure types influence the approval processes that apply and the way that land and water development proposals may proceed. Land tenure types and native title considerations also dictate the lawful rights and interests that Aboriginal and Torres Strait Islander people have over particular lands and waters in the NT.

Although it may appear that the NT is endowed with an abundance of good agricultural land and available water resources, the range of regulatory assessment and approval processes that must be navigated to secure those resources is inherently complex and multifaceted and is often protracted in duration. However, there are clear signs in the water, land and environmental assessment spaces that all NT agencies are currently working on a program of regulatory process efficiency improvements and policy reforms to address this.

Given these challenges, the Northern Territory Government has identified the importance of providing development coordination assistance to proponents to support them through the environmental regulatory approvals required for project development. This will ultimately include assisting proponents by mapping the required approval processes and time frames for individual projects.

2 Introduction to this case study

This case study examines the suite of regulatory considerations and approvals that apply to all land and water development proposals in the NT and then identifies the specific requirements (e.g. plans, policies, etc.) that are applicable to the Roper catchment.

Much of the information presented in this case study has been collated from, and often directly quotes, a plethora of useful information that is published across multiple Northern Territory Government websites.

The objective of this case study is to bring information about NT's current land and water regulatory and approvals landscape together and structure it in an orderly way. It is intended to provide a useful introduction to the topic for proponents and others with an interest in advancing new developments in the NT (and the Roper catchment in particular).

Some of the aspects that are discussed (such as environmental assessment requirements) are likely to be familiar to people who have been involved in developments in other Australian states. However, some features of the NT regulatory framework are either unique to the Territory (such as Aboriginal freehold land) or exist to an extent that is materially more significant than in other states (such as the implications of native title for pastoral leasehold land).

This case study is structured as follows:

- Section 3 outlines the NT's unique planning context and key characteristics of the Roper catchment's physical environment.
- Section 4 examines land tenure and availability considerations, as well as land-related assessment and approvals including requirements and processes relating to native title, land clearing, non-pastoral use, land use and development planning.
- Section 5 outlines how the water allocation framework is applied under the *Water Act 1992* (NT), the role of water control districts, the requirements of a range of water policies and guidelines, the provisions of water allocations plans and the terms and conditions of water extraction licences.
- Section 6 examines environmental assessment considerations as they relate to land and water developments including environmental impact assessments (EIAs) and approvals, environmental protection approvals and licences, and environmental management plans.
- Section 7 discusses efforts being made to implement efficiency improvements and policy reforms to land, water and environmental assessment processes in the NT (Petheram et al., 2018).

3 Context

Potential investors or developers who are new to the NT may be unfamiliar with the distinctive circumstances that underpin its people, waters and lands. This section aims to summarise the special planning context and characteristics of the physical environment that makes the NT unique compared to other Australian states.

3.1 Northern Territory planning context

The NT's planning context is considered unique compared to other state jurisdictions:

- The NT is a large area with a small overall population with a relatively high proportion of Indigenous residents.
- The NT is at an early stage of development with a relatively small number of water licences. However, there is significant interest in agricultural development opportunities in the NT because of a perceived abundance of land and water availability.
- The current climate is characterised by highly seasonal variations and this is expected to continue. Because of the highly seasonal climate conditions it is difficult to access surface water flows.
- The NT is highly reliant on groundwater, which in some cases is not recharged on a seasonal basis (Badu Advisory, 2023).

In addition to the above, the nature and composition of NT land tenure types are particularly important influences on the way that land and water development proposals are likely to proceed.

Around 49% of land in the NT is pastoral leasehold land, which is leased by the government to private individuals or companies for grazing cattle, growing crops, or engaging in pastoral-based tourism activities (see Section 4.4). In the NT, consent is required from landholders to clear native vegetation on pastoral land. Provisions exist to allow landholders to use part of their pastoral lease for alternative purposes, subject to first obtaining approval as discussed in Section 4.6.

Pastoral land is also subject to native title. Under Australian law, this means that Aboriginal and Torres Strait Islander people have rights and interests to their land according to their traditional law and customs. Aboriginal people are required to demonstrate a continuous and unbroken connection to their land since colonisation in order to establish native title. Native title may include, for example, rights for Traditional Owners to live on an area, access it for hunting, fishing or gathering traditional resources, as well as undertake cultural activities.

Separate to this, around 50% of land in the NT is Aboriginal freehold land that is formally held by Aboriginal Land Trusts (ALTs). An ALT may grant an estate or interest in such land to a proponent if directed by a land council subject to their first consulting with, and obtaining the consent of, Traditional Owners as well as consulting more broadly with the relevant Aboriginal communities and Aboriginal groups. As mentioned in Section 4.3, this means that proponents may negotiate with land councils and enter into an Indigenous Land Use Agreement (ILUA) as a pathway for obtaining consents for infrastructure tenements and other associated tenure.

Overall, the above planning context means that despite there being significant potential to develop fertile land and water resources in the NT, project proponents are likely to find that obtaining approval to utilise these resources is a relatively complex and sometimes protracted process compared to other states.

However, there are clear indications that all agencies in the NT – including in the fields of water, land and environmental assessment – are actively engaged in enhancing the focus, effectiveness and efficiency of their regulatory processes, including revising key policies to overcome this issue.

In addition, the Northern Territory Government has identified the need to provide proponents with guidance and assistance in understanding and navigating development and approval processes. More recently, this has included agencies providing support to proponents by mapping the required approval processes and time frames for individual projects as discussed in 7.2.

3.2 Characteristics of the physical environment of the Roper catchment

The Roper catchment is located in the north-east of the NT with surface waters flowing to the Gulf of Carpentaria (see Figure 3-1).

The Roper catchment's physical environment is characterised by a number of attributes:

- A large proportion of the land area has soils which are suitable (with some limitations) for agriculture.
- The climate is hot, arid and highly seasonal, with an extended dry season and 96% of rainfall falling during the wet season.
- Most rivers in the catchment are ephemeral, complex systems of braided streams, flowing less than 30% of the time, and reducing to a few scarce and vulnerable waterholes during the dry season.
- In the catchment, 97% of all runoff occurs during the wet season and 80% of all runoff occurs during the 3-month period from January to March.
- The main groundwater resource in the Roper catchment is the Cambrian Limestone Aquifer and the Dook Creek formation.
- Old fractured igneous and metamorphic rocks occur over approximately 80% of the Roper catchment, which may yield small quantities of groundwater to support stock and domestic use (Petheram et al., 2018).

NT's land and water allocation and management laws, policies and management approaches have evolved in response to these characteristics as well as the unique planning context described earlier. In the Roper catchment, project proponents particularly need to be aware of the highly ephemeral nature of natural water resources when conceptualising and designing their development proposals and business plans. In particular, the availability of water supplies in the Roper catchment are likely to be highly episodic – with lower annual reliabilities – compared to existing water supply systems located in other states.

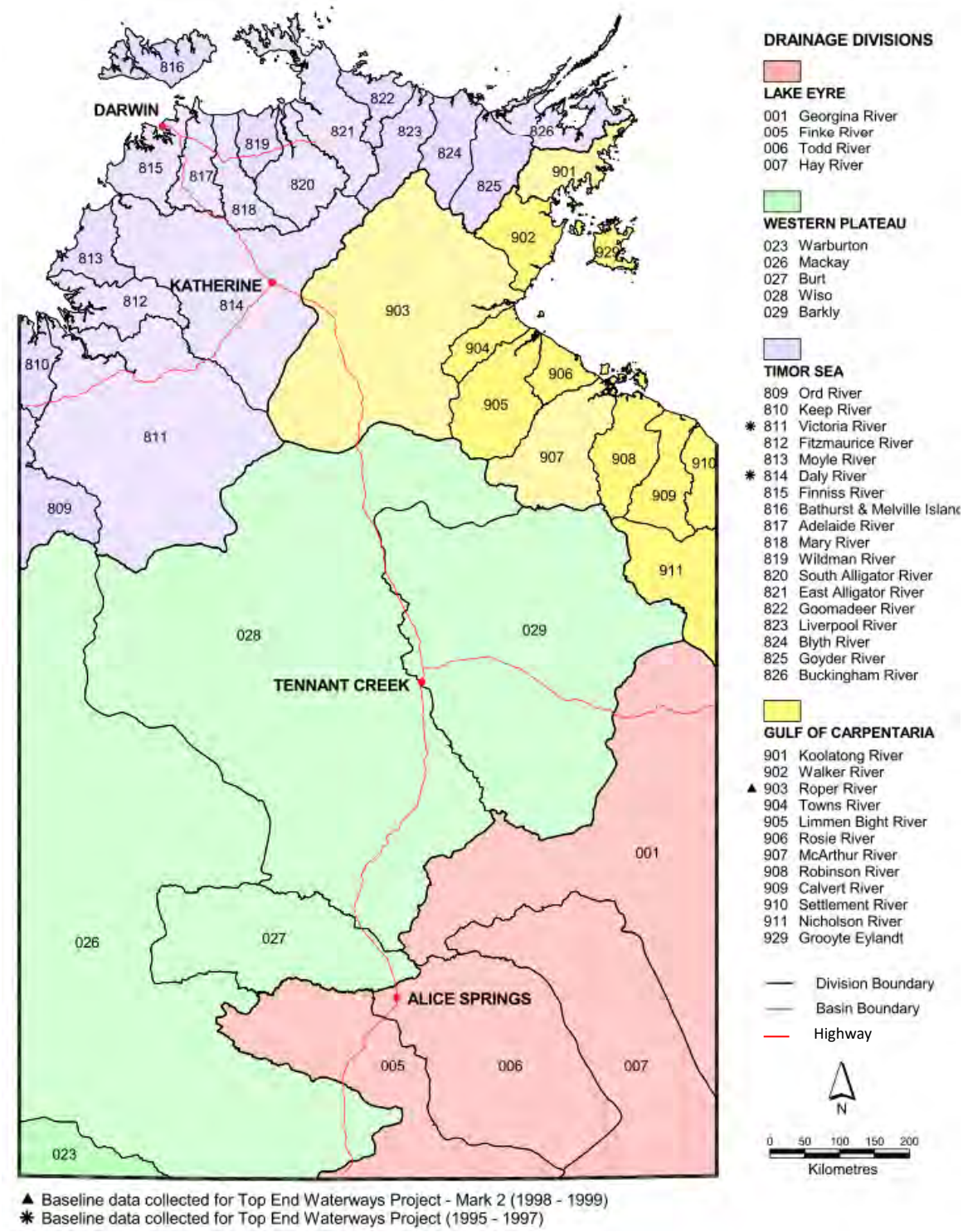


Figure 3-1 Northern Territory drainage divisions and river basins

Source: DENR Top End Waterways Project (2001). Drainage divisions and basins as defined by the Australian Water Resources Council (Map 1, Faulks, 2001).

4 Land tenure, availability and authorisations

Investors and developers who have had experience in the NT inevitably reflect on how land tenure type fundamentally shapes the types of opportunities that may be available in different places – or on particular properties – within the Territory. Land tenure also has an important bearing on the approval processes (and timeframes) that are likely to be applicable to specific development proposals. This section examines the role that land tenure type has in influencing such developments.

4.1 Land tenure types in the NT

The main types of land tenure in the NT are:

- NT freehold
- Aboriginal freehold
- pastoral leasehold
- Commonwealth lease.

Approximately 45,000 km^2 of the NT are managed by the Parks and Wildlife Service NT as parks or reserves. About one-third of these are managed in partnership with Aboriginal people.

Aside from towns and national parks, most land in the NT is either Aboriginal freehold (50%) or pastoral leasehold land (49%) over which native title rights can exist (NT Govt, 2023a).

4.2 Northern Territory freehold land

Freehold land means all interest in the land, other than resources, has been passed onto the owner. House blocks in cities or towns are typically freehold land. Freehold land is not affected by native title (NT Govt, 2023b).

4.3 Aboriginal freehold land

Aboriginal freehold land does not exist in any other state or territory in Australia and is unique to the NT. It arose from the *Aboriginal Land Rights (Northern Territory) Act 1976* (ALRA NT), which converted former Aboriginal reserves into permanent Aboriginal freehold in 1976. Aboriginal freehold land is formally held by ALTs and cannot be sold as it is inalienable freehold title (NT Govt, 2023c).

Land councils have statutory functions with respect to resource exploration and development under several statutes including the ALRA NT and the *Native Title Act 1993* (Native Title Act) (AustLii, 2023).

The four land councils within the NT (NT Govt, 2023d) are:

- Northern Land Council (NLC) that covers the northern portion of the NT including the Roper catchment
- Central Land Council (CLC) that covers the southern portion of the NT
- Tiwi Land Council that covers Melville and Bathurst islands and numerous smaller uninhabited islands (TLC, 2023)
- Anindilyakwa Land Council that covers the Groote Archipelago (ALC, 2023).

Under s 19 of the ALRA NT, an ALT may grant an estate or interest in ALRA NT land to a proponent if directed by a land council. However, the land council cannot direct the ALT to do so without first consulting with, and obtaining the consent of, Traditional Owners. Additionally, the land council must consult with the relevant Aboriginal communities and Aboriginal groups (CLC and NLC, 2020).

The ALRA NT is designed to streamline compliance with various statutory requirements under Australian and NT law in relation, for example, to the management of sacred sites and other related matters. Proponents may negotiate and enter into an ILUA with land councils, which can provide consents for infrastructure tenements and other associated tenure (CLC and NLC, 2020).

4.4 Pastoral leasehold land

Around half of the land within the NT is pastoral leasehold land. This is a type of land tenure that is leased by the government to a private individual or company for the purpose of grazing cattle, growing crops, or engaging in pastoral-based tourism activities (NT Govt, 2023e).

Figure 4-1 presents a map of pastoral districts in the NT.

Pastoral leasehold land is subject to native title, which has important implications for development proponents as discussed in the sections below.

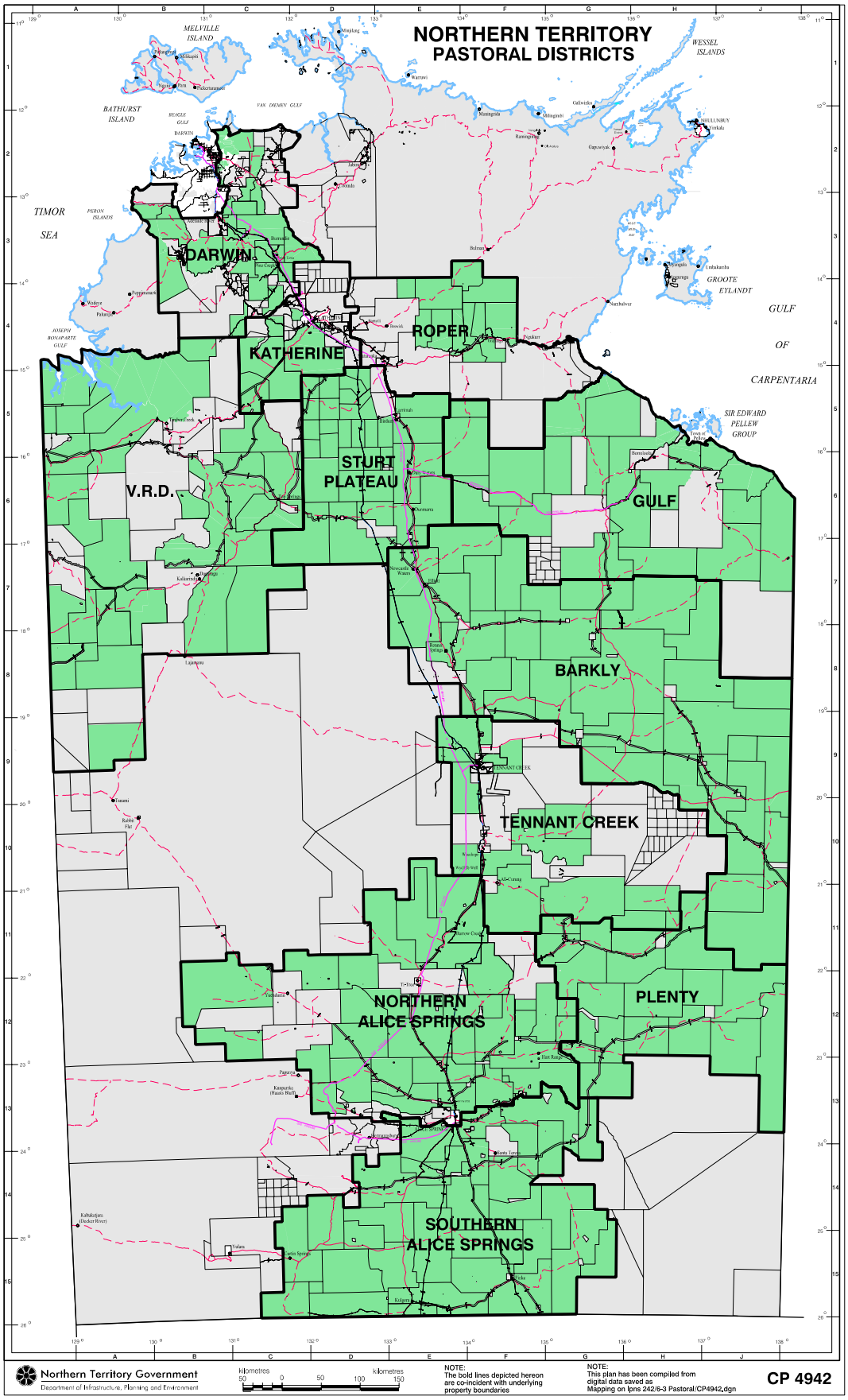


Figure 4-1 Northern Territory pastoral district map

Source: DIPE (2002)

Native title

Aboriginal people have common law rights to their traditional land and waters under the Native Title Act, which includes the ability to live, camp, conduct ceremonies, hunt, fish, collect food, build shelters and visit places of cultural significance in areas where native title is legally recognised. Such rights apply to pastoral land, but not to NT freehold land or Crown land used for public purposes like roads, railways and public buildings (NT Govt, 2023f).

Native title recognises the traditional rights and interests of Indigenous peoples to their land and waters. As per the Native Title Act, those claiming native title can seek recognition of their rights in the High Court of Australia (NIAA, 2023).

The NLC and CLC are native title representative bodies under the Native Title Act (NNTT, 2023).

A Native Title Information Handbook was published in 2016 by the Australian Institute of Aboriginal and Torres Strait Islander Studies that provides further detailed information relating to native title in the NT (AIATSIS, 2016).

Traditional Owners and the Aboriginal community

Traditional Owners refers to individuals or groups who have a primary spiritual connection to specific sites or areas of land, or who hold rights and interests in land based on traditional laws and customs. The term 'Aboriginal community' generally encompasses all Aboriginal people residing in a particular area, including those who may be Traditional Owners in other regions (CLC and NLC, 2020).

CLC and NLC (2020) observe that Traditional Owners have rights beyond those held by the Aboriginal community, including rights to negotiate or provide consent under the Native Title Act and ALRA NT. They note that although native title agreements and ALRA NT agreements are negotiated on behalf of Traditional Owners, some terms of the agreements may cause benefits to flow to a broader group of local Aboriginal people, such as employment and local enterprise procurement requirements.

Aboriginal land

Land councils receive requests from government agencies and other parties seeking permission from Traditional Owners to undertake a range of activities on Aboriginal land. In this context, Aboriginal land means Aboriginal freehold land (as mentioned in Section 4.3) or NT freehold land (as mentioned in Section 4.2) that has been granted to Aboriginal associations or corporations under NT law (CLC, 2023).

4.5 Northern Territory Land Corporation land

Land holdings

The NT Land Corporation is an entity that is independent of government and established by (and subject to) the *Land Corporation Act 1986* (NT) (NTLC, 2023a).

It maintains key NT land holdings and preserves strategic land to ensure that short-term projects and activities do not damage or erode the long-term potential and purpose of the land. Its land assets may be subleased or released for pastoral activities to third parties under licence. Activities undertaken by third parties on land releases must not compromise the future use of the land, impact on the environmental condition of the land or be permanent in nature. It is a condition of NT Land Corporation Project Agreements that successful proponents must obtain all necessary approvals and agreements before any works commence on the land (NTLC, 2023b).

Land releases

The NT Land Corporation will only release land when it considers the time is right and there is demand, or suitable development investment capital, available to achieve its long-term vision and will realise its full potential for the benefit of Territorians (NTLC, 2023b).

NT Land Corporation uses competitive processes, external probity auditors and independent assessment panels to provide advice on its larger projects and assists in selecting preferred proponents. Some land releases may include handing land directly to a government authority or other organisation for its long-term use to be realised. This can be either when resources have been released to develop the land asset in accordance with its long-term vision or when the proposed long-term use is sufficiently specialised that the NT Land Corporation considers that a specific agency required to deliver its designated purpose (NTLC, 2023b).

Agricultural precincts

In December 2020, recommendations within a final report of the Territory Economic Reconstruction Commission were accepted by the Territory Government to:

> *… enable the Territory to target and win new investment, create new jobs and new opportunities.* (NT Govt, 2022).

These included a recommendation to rapidly identify and develop key Sustainable Development Precincts.

Subsequently, the NT Land Corporation has called for expressions of interest for large-scale agricultural land developments referred to as agricultural precincts. The Larrimah Agricultural Precinct spans an area of almost 6000 ha within the Roper catchment and is located 180 km south of Katherine and just south of the Larrimah township (DEPWS, 2023a).

A soil and land suitability assessment for irrigated agriculture was completed by the Department of Environment, Parks and Water Security (DEPWS) in 2019 that identified four areas of suitable land for irrigated crops in the precinct (NT Govt, 2023g). A land clearing application for the precinct has also been lodged and is currently being assessed. In December 2022, NTLC (2022) announced that Larrimah Farms Pty Ltd was the preferred developer of the precinct.

Other current examples of agricultural precincts in the NT outside of the Roper catchment include:

- Wildman Agricultural Precinct that encompassed approximately 26,000 ha of land located 135 km east of Darwin (DEPWS, 2021a)

- Keep Plains Agricultural Development which is a 67,500-ha site on the NT side of the border abutting existing Ord River agricultural developments (DEPWS, 2021b).

The environmental approvals processes that specifically apply to each of the three agricultural projects have been mapped by DEPWS and are available online (DEPWS, 2023a).

4.6 Permits under the Pastoral Land Act

Land clearing permits

Landholders must have consent in order to clear native vegetation on pastoral land in the NT. The Pastoral Land Board (PLB) makes determinations about applications for pastoral land clearing (PLC) under the *Pastoral Land Act 1992* (NT).

Application types may either be a simplified application (for an area less than 1000 ha not involving any irrigation) or a standard application (otherwise). Simplified applications involve a 6-week assessment process for which assessment criteria are set out in Schedule 1 in the PLC guidelines (PLBNT, 2022a). Standard applications involve a six month assessment process for which requirements are set out in the PLC guidelines (NT Govt, 2023h).

Some examples of the types of matters mentioned in the PLC guidelines include whether the application has demonstrated consideration of the retention of native vegetation adjacent to waterways, wetlands and rainforests. In the case of the Roper catchment, which is comprised of complex systems of braided streams, retaining a buffer of native vegetation adjacent to waterways and wetlands is likely to materially reduce the area of land allowed to be cleared. Applicants must also calculate their estimated greenhouse gas emissions. If they exceed 500,000 tCO_2e, a greenhouse gas abatement plan must be included with the PLC application (PLBNT, 2022a).

Proposals that could have a significant impact on the environment must be referred to the NT Environment Protection Authority (NT EPA) as per the provisions of the *Environment Protection Act 2019* (NT). The PLB requires a pastoral lessee to self-refer, or to obtain appropriate advice from the NT EPA that self-referral is not required, if the proposed clearing results in a total area of greater than or equal to 5000 ha to be cleared in aggregate (PLBNT, 2022a).

A PLC application takes approximately 6 months to assess. An applicant may also be required to apply for a water extraction licence and/or a non-pastoral use (NPU) permit depending on the intended use of the subject land. The action may also need to be referred to the NT EPA under the Environment Protection Act (PLBNT, 2022a).

Non-pastoral use permits

The Pastoral Land Act provides for diversification activities on pastoral leases, subject to approval by the PLB through the issuing of an NPU permit. NPU permits allow landholders to use part of their pastoral lease to create alternative streams of revenue. An NPU permit can be approved or renewed for up to 30 years (DEPWS, 2022a).

The PLB determine applications for an NPU permit in accordance with the Pastoral Land Act. The assessment process is coordinated by the Land Development Corporation on behalf of the PLB.

Assessment of NPU applications typically takes 6 months. The action may also need to be referred to the NT EPA under the Environment Protection Act. The PLB determines NPU applications by referring to the NT Non-Pastoral Use Guidelines (PLBNT, 2022b), which are administered by the Minister for Environment, Climate Change and Water Security. The guidelines aim to ensure that developments are productive and limit adverse impacts on environmental and cultural values (DEPWS, 2022a).

Landholders proposing to undertake NPU activities that require clearing of native vegetation and/or is for an irrigated land use must also apply for a PLC permit, a water extraction licence and, if relevant, a variation to an existing PLC permit. For simple proposals, PLC, NPU and water extraction licence applications may be lodged at the same time. However, complex proposals require a water extraction licence to be lodged first (NT Govt, 2023i).

Pastoral leases in the NT are subject to, and coexist with, native title. Native title can exist without a determination, or the existence, of a native title claim. Therefore, it is essential to ensure that obtaining consent for NPU complies with the Native Title Act provisions. The Native Title Act allows certain activities on pastoral leases if specific procedural requirements are met. The PLB must provide notice to relevant native title representative bodies, native title holders and registered native title claimants of the application for an NPU permit and provide them with an opportunity to comment in order to comply with these requirements (PLBNT, 2022b).

Procedural requirements apply to NPU activities on a pastoral lease that are defined as (or associated with) primary production or are farm-based tourism activities (except where they relate to Aboriginal cultural activities or works) (PLBNT, 2022b).

4.7 Land use and development planning

Land use planning and development in the NT is regulated by:

- the *Planning Act 1999* (NT) (Planning Act) and *Planning Regulations 2000* (NT) – these regulations control the development and usage of land in the NT and define planning schemes, the Development Consent Authority, and the Planning Commission
- the NT Planning Scheme 2020 (Planning Scheme) – the zoning system divides land in the NT into specific areas, determining the permitted use and development within each zone. This system does not pertain to the use or development of unzoned land
- development permits and exceptional development permits for authorising the use and development of specific parcels of land (EDO, 2022).

Most land in the NT is sparsely populated, unzoned and not subject to the NT Planning Scheme. However, the Planning Act applies to removal of native vegetation in excess of 1 hectare if not regulated by another Act (EDO, 2022).

In addition, subdivision of land for a pastoral activity does not require consent under the Planning Act when under the auspices of the *Pastoral Land Act 1992* (NT).

Planning applications usually relate to development or exceptional development permits, planning scheme amendment requests or concurrent applications which may involve a combination of these) in populated areas (NT Govt, 2023j).

Land clearing permits for unzoned land

The Planning Act governs the clearing of native vegetation on unzoned land and is subject to the NT Planning Scheme Land Clearing Guidelines (DEPWS, 2021c). DEPWS make decisions regarding land clearing on unzoned land as the Delegate of the Minister for Planning, Infrastructure and Logistics (DEPWS, 2022a).

A land clearing application takes approximately 12 weeks to process. This includes a 4-week statutory public comment period). If more information is required for assessment the application may be deferred (DEPWS, 2022a).

5 Water allocation framework

Like other Australian states, the allocation and management of water resources in the NT are subject to stringent rules and regulations that have been developed over time. Although the specifics in the NT may differ in some respects from other states, in effect all Australian states and territories seek to ensure that their water allocation and planning arrangements are consistent with the principles and provisions of the National Water Initiative. This section aims to outline the water allocation and management provisions that apply in the NT.

5.1 The Water Act

The NT's water resources are managed and protected under the *Water Act 1992* (NT). A person must not take or use surface water or groundwater, except in accordance with a licence granted under, or otherwise allowed by, the Act (DEPWS, 2023b).

Under the Water Act, a licence is required for the extraction of groundwater or surface water, except for stock and domestic use, or for mining and petroleum activities. It is anticipated that water use for mining and petroleum activities will also be subject to licensing under the Water Act in the future. To obtain a water extraction licence, the licence holder must have legal access to the land from which the water will be taken (DEPWS, 2020a).

The Act designates the Controller of Water Resources as the primary authority responsible for licensing and regulating water resources. Under ss 45 and 60 of the Act, the Controller is authorised to issue licences for water extraction and has the authority to establish the terms and conditions of the licence. Licences are subject to conditions, including the specification of minimum and maximum volumes of water that can be extracted during any given period (DEPWS, 2023c).

In making a decision on a water extraction licence application, the Controller must consider the relevant factors set out in s 90(1) of the Act (DEPWS, 2020a). As set out in the Act, the Controller can also grant a permit or licence:

- to explore for water (s 36 of the Act)
- to interfere with a waterway (s 41 of the Act)
- for drilling (s 49 of the Act)
- for bore work (s 57 of the Act)
- to take groundwater for hydraulic fracturing (s 60A of the Act)
- for underground water disposal (s 63 of the Act)
- for recharge (s 67 of the Act)
- to grant a developer an authority to take water (s 71G and s 71H of the Act)
- waste discharge (s 74 of the Act).

The Water Act also exempts certain activities from the operation of the Water Act (DEPWS, 2023d). Ultimately, decisions must be consistent with the Act as well as Northern Territory Government policies (DEPWS, 2020a).

Water control districts

Areas where improved management of water resources is necessary are designated as water control districts. This is to avoid overusing groundwater reserves, river flows or wetlands. The Minister for Environment, Climate Change and Water Security can declare water control districts under the Water Act. Water control districts facilitate closer management of water resources and enable the development of water allocation plans (NT Govt, 2023k).

The Roper catchment is contained within the Daly Roper Beetaloo Water Control District as shown in Figure 5-1.

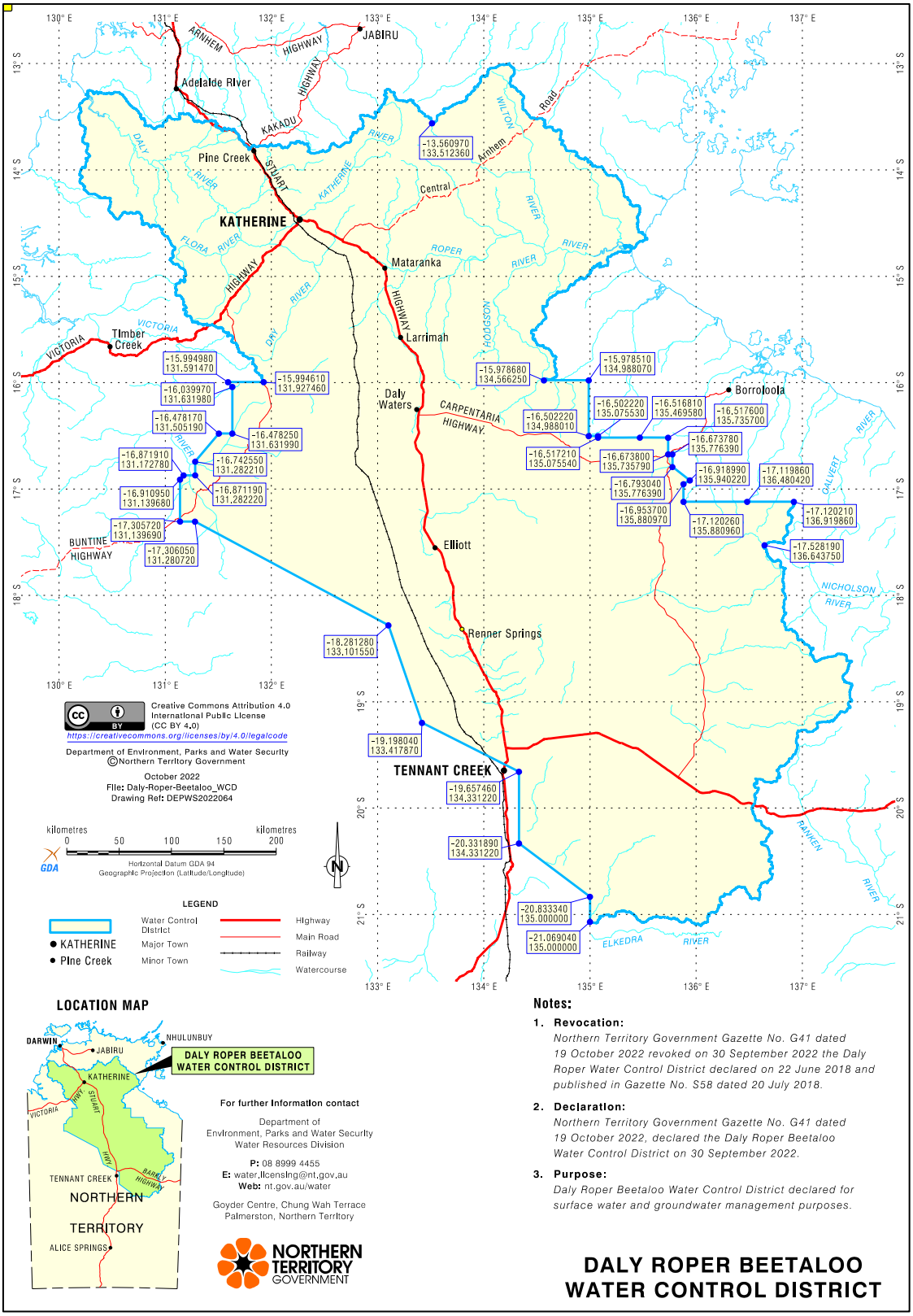


Figure 5-1 Daly Roper Beetaloo Water Control District

Source: NT Govt (2023k). Creative Commons licence.

5.2 Water policies and guidelines

Northern Territory Water Allocation Planning Framework

For places where there is a paucity of science regarding environmental and cultural water requirements, the Northern Territory Water Allocation Planning Framework (Framework) sets out water resource allocation rules (DEPWS, 2021d).

The Framework applies to water resources both within and outside water allocation plan areas. It allocates water to non-consumptive beneficial uses (e.g. environmental and cultural values) as a matter of priority with any remaining water being made available to consumptive beneficial uses (e.g. agriculture) (DEPWS, 2023e).

Contingent allocations

The Framework provides for provisional allocations for both consumptive uses (which form the 'consumptive pool') and non-consumptive uses in cases where there is a lack of scientific research on environmental or cultural water requirements. In addition, it permits the establishment of alternative allocations based on scientific research in situations where such research is available (DEPWS, 2023e).

Different water allocation rules are applied in the Top End versus the arid zones of the NT based on their distinct recharge and hydrological characteristics. In the Top End, safeguarding discharges to rivers and springs is a priority while in the arid zone the focus is on managing stored water and groundwater-dependent flows (DEPWS, 2021d). The delineation between these zones has been typically based on geography and climate rather than the more precise hydrological behaviour of the water resources. DEPWS undertook an assessment of the water resources in the region to categorise resources based on their climate characteristics and hydrological responses (Short et al., 2020).

The hydrologic characteristics of the groundwater resources in the Roper catchment have been examined by Taylor et al. (2023). Taylor et al. (2023) found that the physical characteristics of sediments and rocks within the major geological divisions heavily influence the groundwater resources within the Roper catchment with the largest groundwater resource being the Cambrian Limestone Aquifer (CLA). This extends well beyond the Roper catchment as shown in Figure 5-2. Groundwater in the CLA flows to areas with lower groundwater level inside the Roper catchment from areas with higher groundwater levels outside of the catchment (Taylor et al., 2023).

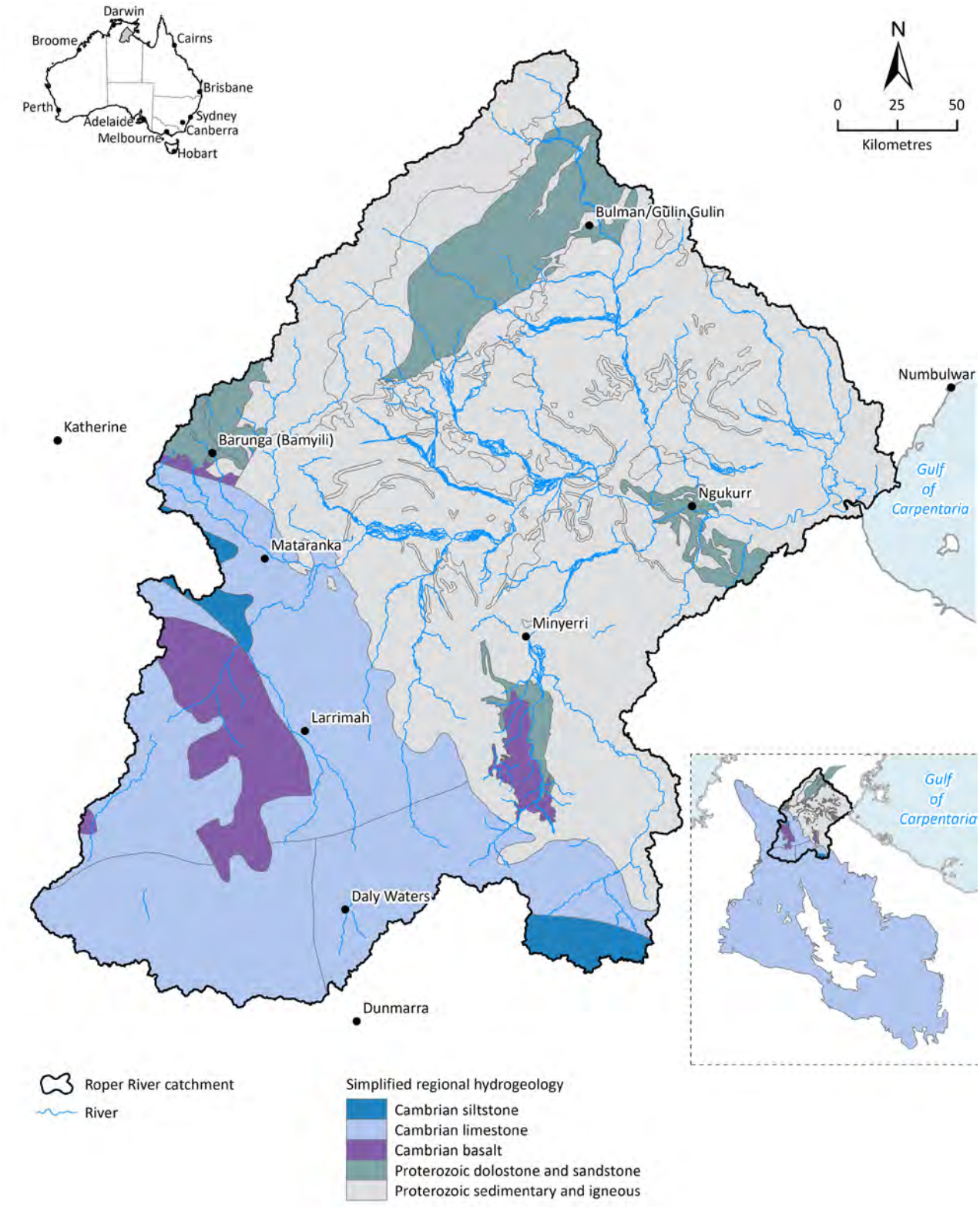


Figure 5-2 Simplified regional hydrogeology for the Roper catchment. Inset shows the entire spatial extent of the Cambrian limestone

Source: Taylor et al. (2023)

The contingent allocations in the Top End are:

- For rivers:

  At least 80% of flow at any time in any part of a river is allocated as water for environmental and other public benefit water provision, and extraction for consumptive uses will not exceed the threshold level equivalent to 20% of flow at any time in any part of a river. In the event that current and/or projected consumptive use exceeds the 20% threshold level, new surface water licences will not be granted unless supported by directly related scientific research into environmental other public benefit requirements. (DENR, 2020)

- For aquifers:

  At least 80% of annual recharge is allocated as water for environmental and other public benefit water provision, and extraction for consumptive uses will not exceed the threshold level equivalent to 20% of annual recharge. In the event that current and/or projected consumptive use exceeds the 20% threshold level, new groundwater licences will not be granted unless supported by either directly related scientific research into groundwater-dependent ecosystem / cultural requirements, or in the absence of such research, hydrological modelling confirming that total groundwater discharge will not be reduced by more than 20%. (DENR, 2020)

The contingent allocations in the arid zone are:

- For rivers:

  At least 95% of flow at any time in any part of a river is allocated as environmental and other public benefit water provision, and extraction for consumptive uses will not exceed the threshold level equivalent to 5% of flow at any time in any part of a river. In the event that current and/or projected consumptive use exceeds the threshold level of 5% for river flow, new surface water licences will not be granted unless supported by directly related scientific research into environmental other public benefit requirements. (DENR, 2020)

- For aquifers:

  There is to be no deleterious change in groundwater discharges to dependent ecosystems, and total extraction over a period of at least 100 years will not exceed 80% of the total aquifer storage at start of extraction. In the event that current and/ or projected consumptive use exceeds the threshold level of 80% of the consumptive pool for aquifers, or groundwater discharges to groundwater-dependent ecosystems are impacted, new groundwater licences will not be granted unless supported by directly related scientific research into groundwater-dependent ecosystem / cultural requirements. (DENR, 2020)

Draft Surface Water Take – Wet Season Flows Policy

The draft Surface Water Take – Wet Season Flows Policy (NT Govt, 2023l) is currently under review. If approved, DEPWS (2023e) states that 'the policy will replace the Northern Territory Water Allocation Planning Framework in guiding water licensing decisions and management for surface water extraction licences to take water (such as from rivers and creeks) during the Top End wet season to store and use during the dry season'.

The key purpose of the policy is to make the Northern Territory Government's approach to making surface water licence decisions for this type of water transparent. It aims to 'establish the allocation rules for quantifying wet-season water flow volumes available for consumptive use from a river basin, while maintaining free-flowing rivers and important environmental and cultural values'. The policy will establish a hierarchy of allocation rules for taking surface water in the wet season and provide guidance on water extraction licensing (NT Govt, 2023l).

The policy requires that 'all surface water licensing decisions to take water in the Top End during the wet season… be based on research and knowledge relevant to the river basin and appropriate to the point of take [and that]… if there is insufficient research and knowledge, a precautionary approach to allocating water will be taken based on the policy's contingent allocation rules' (NT Govt, 2023l).

Under the policy, the following hierarchy will be used to determine the volume of water to be allocated from wet-season water flows to consumptive uses, and to inform licence decisions:

1. *Scientific research: relevant, available scientific research establishes the maximum volume of water that may be extracted from the relevant river basin, while maintaining important hydraulic conditions, environmental and cultural water requirements.*
2. *Contingent allocation rule: to be applied when scientific research is not available. Typically, the previous 50-year flow data will be used to determine the consumptive pool. The consumptive pool is calculated as 5% of the 25th percentile of total flows for the three highest flow months of the year (generally January, February and March).* (NT Govt, 2023l)

When using the contingent allocation rule, the policy proposes to apply the following principles:

- *The total wet-season consumptive pool will be determined for the river basin, based on the flows at a location upstream of tidal influence.*
- *The total wet-season consumptive pool will exclude transitional flows, including transition from dry to wet season (generally November to December) and wet to dry season (generally April to May).*
- *The total flows will be determined using the historical data (typically 50 years) based on available data from relevant department gauging stations. If there are no available data, the total flows will be calculated using the department's surface water models.*
- *The calculated total wet-season consumptive pool will be reported with a reliability measure.*
- *The proportion of the total wet-season consumptive pool available to take under a licence will be calculated based as a proportion of the total catchment flow. Generally, this means the further downstream the point of take the greater the portion of the wet-season consumptive pool that would be available.* (NT Govt, 2023l)

The policy is intended to work alongside the Northern Territory Water Allocation Planning Framework. The latter will establish contingent allocation rules for taking water from groundwater and surface water sources but will not apply to surface water take during the wet season. Apart from matters relating to quantifying the consumptive pool and water availability, wet-season

water extraction licence applications would be processed in accordance with the Processing Water Extraction Licence Applications policy (NT Govt, 2023l).

A licence will have a number of aspects to its terms and conditions. It will establish a total maximum volume of water that can be taken by the licence holder in a specified period. While taking water will not be restricted to the three wettest months of the wet season, it will be subject to minimum flow conditions in the relevant river basin. This means that water must not be taken when specified minimum flow thresholds are not met in the river basin. Licensed water take will also have a maximum instantaneous flow rate (NT Govt, 2023l).

Draft Interference with a Waterway Guideline

Infrastructure for the take and storage of large quantities of water may require a permit to interfere with a waterway (NT Govt, 2023m).

The Controller has the power under s 41 of the *Water Act 1992* (NT) to grant a permit to interfere with a waterway. The Controller also has the power to set the terms and conditions of a permit. Under s 42 of the Act, it is an offence if the conditions of a permit are not complied with. In making a decision on a permit to interfere with a waterway the Controller must consider the relevant factors under s 90 of the Act.

A draft Interference with a Waterway Guideline has been developed (NT Govt, 2023n). It takes a risk-based approach to determining the level of information required to support an application or condition for a permit depending on the level of interference (NT Govt, 2023l). It provides guidance for an application for a permit to interfere with a waterway. It also describes the assessment process for activities which may cause a change in flows, the shape of a waterway or bed or bank stability.

As listed in the Guideline (NT Govt, 2023n), activities that may require a permit include:

- extraction of materials from a waterway
- construction within a waterway
- conduction of construction of waterway crossings or flood protection works
- diversion of surface water or stormwater
- installation of surface water diversion structures, bunds and drainage works that change the flow regime in a waterway
- diversion of waterway/watercourse
- diversion of a formed watercourse, such as a waterway diversion
- capture and storage of stormwater or surface water flows
- installation of water retention structures, such as a dam or barrage
- conduction of an offstream water storage installed within a waterway (NT Govt, 2023n).

There are four primary risks associated with an interference with a waterway. These include erosion and sedimentation, changes to water quality, changes to hydrology and changes to substrate. The permit assessment process firstly identifies whether an activity is able to cause one of the risks to occur and, if so, whether any of key waterway features are able to be impacted. Following this, the assessment focuses on identifying the likelihood and consequence of the risk,

considering the activity and the waterway in context. Where appropriate, the assessment may also identify monitoring and management controls (NT Govt, 2023n).

To apply for a permit, applicants are required to supply information that summarises relevant aspects of the proposed activity. This includes a justification for the purpose of the interference as well as its proposed design and construction and operations schedule. The application must also address key risks of the activity and identify any relevant mitigation measures and management plans (NT Govt, 2023n).

Permit conditions are designed to address the specific risks associated with each activity. Depending on context, permit conditions may vary from routine to activity or site specific. As set out in the Guideline (NT Govt, 2023n), conditions may include obligations such as:

- ensuring works are undertaken in accordance with the submitted plans
- requiring an erosion and sediment control plan
- progressive monitoring and reporting to the Controller
- rehabilitation activities (NT Govt, 2023n).

Trading Licensed Water Entitlements Policy

The Trading Licensed Water Entitlements Policy (DEPWS, 2020b) provides guidance to the Controller on the trading of licensed water entitlements in the NT (DEPWS, 2023f). The Controller determines all trades, including those from an Aboriginal water reserve.

The policy complements the Water Act by establishing general policy principles that apply to trading licensed entitlements. It also supplements water allocation plans which establish specific trading rules for defined locations. A licensed entitlement may only be traded within a water allocation plan area. Licences with and extraction points outside of a declared water allocation plan area are not subject to the policy. Trades are allowed when the Controller approves an agreement between two or more licence holders (DEPWS, 2020b).

A trade may be temporary (less than the remaining term of a seller's licence) or ongoing (for the remaining term of the seller's licence). Water allocation plans may establish a maximum period of time for which a licensed entitlement can be traded (DEPWS, 2020b).

In practise, the occurrence of water trades is limited which probably is related to the relatively low extent to which water resources are currently allocated.

In the Top End where the Roper catchment is located, water availability changes each year depending on the wet season. This means that licences in the Top End may be granted with a water security category for the licensed entitlement. There are five security classifications that may be used in the Top End viz. total/public water supply, high or priority, medium or general, low and not specified. The security level of a licensed entitlement does not change under either a temporary or ongoing trade (DEPWS, 2020b).

Licensed entitlements from an Aboriginal water reserve may be traded for a temporary trade term in accordance with trading rules specified in the relevant water allocation plan. However an ongoing trade term is generally not allowed where the ongoing trade would result in licensed entitlements being removed from an Aboriginal water reserve (DEPWS, 2020b).

The Strategic Aboriginal Water Reserve (SWR) Policy Framework provides for additional requirements for the consent necessary to trade licensed entitlements. Consent must be given by eligible Aboriginal rights holders or those authorised to act on behalf of eligible Aboriginal rights holders (DEPWS, 2020b).

Recovery of Unused Licensed Water Entitlements Policy

This Northern Territory Government policy (DEPWS, 2020c) outlines when the Controller will consider commencing a process for the recovery of unused licensed water entitlements. The 'recovery of unused licensed water entitlements procedure' (DEPWS, 2020d) provides guidance to the approach used to calculate unused licensed water entitlements (DEPWS, 2023f).

Surface water and groundwater extraction licences issued under the Water Act may require licence holders to use a minimum volume of water at least once in a defined (typically 3-year) period. An unused licensed entitlement (unused water) is when the amount of water that has been used is less than the minimum amount of water that was required to be used in a 12-month period. If the licence holder has unused water for 3 years in a row, the Controller may take action to reduce the maximum entitlement of a licence by the average of the unused water over the 3 years. The volume of any ongoing water trades for 1 or 2 years will not be used to calculate unused water, from the date the trade was approved. However, temporarily trading water 3 years in a row will result in the traded water being used to calculate unused water for each year in that 3-year period (DENR, Undated).

5.3 Water allocation plans

Groundwater and surface water allocation plans and water extraction licences are the primary means through which the Water Act governs the use of groundwater and surface water. Development of water allocation plans are informed by years of technical and scientific assessment and developed in consultation with the community, Aboriginal people, industry and environmental organisations. A water allocation plan is declared by the Minister for up to 10 years. Plans are reviewed at the least every 5 years (DEPWS, 2023g).

Water allocation plans determine how much water can be used and how much must be left to protect the water resource. The first step in developing a water allocation plan is to define the non-consumptive pool required to preserve environmental and cultural assets. The remaining water is designated as the consumptive pool and allocated to declared beneficial uses that are relevant to the water allocation planning area. The Water Act provides for several consumptive beneficial uses including public water supply and stock and domestic (as a priority), then industrial, agricultural, aquaculture and cultural.

Licences are granted within the allocated limits set by a water allocation plan for each beneficial use in the plan area.

The Roper catchment intersects with the following water allocation plan areas (discussed further in the sections below):

- Georgina Wiso Water Allocation Plan
- Mataranka Tindall Limestone Aquifer Water Allocation Plan (in progress)

- Flora Tindall Limestone Aquifer Water Allocation Plan (in progress).

In essence, the availability of water resources is influenced by the specific attributes of the ground or surface water system in a given area. Factors such as groundwater depth, flow rate (transmissivity), water quality (salinity), proximity to groundwater-dependent ecosystems (GDEs), as well as the seasonality and unpredictability of streamflow, are some of the diverse elements that can limit access to water resources (DEPWS, 2023g).

Strategic Aboriginal Water Reserves

The Northern Territory Government published a policy framework for SWRs in 2017. These reserves are a specific volume of water that is set aside within water allocation plans for use, partnership or trade by Aboriginal communities. They are classified as a subclass of certain beneficial use categories within water allocation plans. The policy framework outlines the procedures for incorporating the reserves into existing and future water allocation plans (NT Govt, 2017).

SWRs are designed to be managed exclusively for future economic development by and for the benefit of eligible Aboriginal people. Although similar unallocated water reserves that are designed to enable future economic development by Aboriginal people have been established within some basin water plans in Queensland and other jurisdictions, NT's approach is being systematically applied to all of its water allocation plans and is in addition to cultural flow provisions (which may be part of an environmental flow regime). However, the extent of the uptake of such reserves – both in the NT and elsewhere – has to date been limited.

SWRs are determined by the proportion of eligible Aboriginal lands that are considered to have direct physical access to water. Water allocation plans now designate a portion of the consumptive pool as an SWR that will be managed solely for future economic development for eligible Aboriginal people. A SWR in a water allocation area may be divided into portions where there are multiple eligible Aboriginal entity with rights to access water for consumptive beneficial use. Each eligible rights entity will have the right to grant or withhold consent for access to their portion of the SWR, corresponding to the percentage of eligible land area held by each rights holding group (NT Govt, 2017).

The Department of Environment and Natural Resources will administer the granting of water extraction licences for accessing an SWR. Before an applicant can be considered for a licence or a trade application, they must demonstrate that they have negotiated in good faith and provide evidence of consent from eligible Aboriginal rights holders or their authorised representatives. Only after fulfilling these requirements, will a licence or trade application from an SWR be considered by the Controller (NT Govt, 2017).

Georgina Wiso Water Allocation Plan

The Georgina Wiso Water Allocation Plan (DEPWS, 2023h) is located within the Daly Roper Beetaloo Water Control District and intersects with the Roper catchment. The water allocation plan applies to the groundwater resources in the Georgina Basin and Wiso Basin, which overlay the Beetaloo Sub-basin and are part of the regionally extensive Cambrian limestone aquifer. This means that much of the area is within the arid zone where rainfall and recharge events are

infrequent and the planning focus is on managing groundwater dependent flows and groundwater storage. The water allocation plan has been produced in response to a recommendation from the final report of the Scientific Inquiry into Hydraulic Fracturing of Onshore Unconventional Reservoirs in the Northern Territory viz. that water allocation plans be developed for the Beetaloo Sub-basin as part of any onshore shale gas production (DEPWS, 2023h).

The declared plan area is shown in Figure 5-3, and is approximately 155,000 km^2 extending about 600 km from north to south, and 500 km east to west.

Pastoral leases cover about 85% of the land with approximately 13% of the plan area recognised as Aboriginal land. The plan area includes the towns of Daly Waters, Elliott and Newcastle Waters and the smaller communities of Jangirulu, Likkaparta, Marlinja and Mutunugurra (DEPWS, 2023h).

The public consultation period for the draft plan closed on 16 December 2022 (DEPWS, 2023h). Issues raised in submissions were incorporated into a consultation summary report. Assessment reports associated with scientific studies conducted under the Strategic Regional Environmental and Baseline Assessment were also completed. Relevant content from these reports plus content to address issues raised in the consultation summary report were incorporated into the final version of the Georgina Wiso Water Allocation Plan.

The plan establishes an estimated sustainable yield, for a number of water management zones, for the applicable water in the plan area (i.e. it applies to groundwater within the plan area contained within the Cambrian limestone aquifer). A percentage of the water available for consumptive uses in the plan area is also allocated to the Aboriginal water reserve in accordance with the SWR policy framework. The Aboriginal water reserve is 10% of the estimated sustainable yield for the Georgina Basin water management zone and 17% for the Wiso Basin water management zone. The designated land to which the Aboriginal water reserve applies was identified in consultation with the CLC and NLC (DEPWS, 2022b).

Proponents of developments in that part of the Roper catchment that intersects with the Georgina Wiso Water Allocation Plan area need to be aware of the provisions of:

- the plan that effectively define the availability of surface and groundwater in each zone
- the draft NT Surface Water Take – Wet Season Flows Policy as discussed in section 5.2.

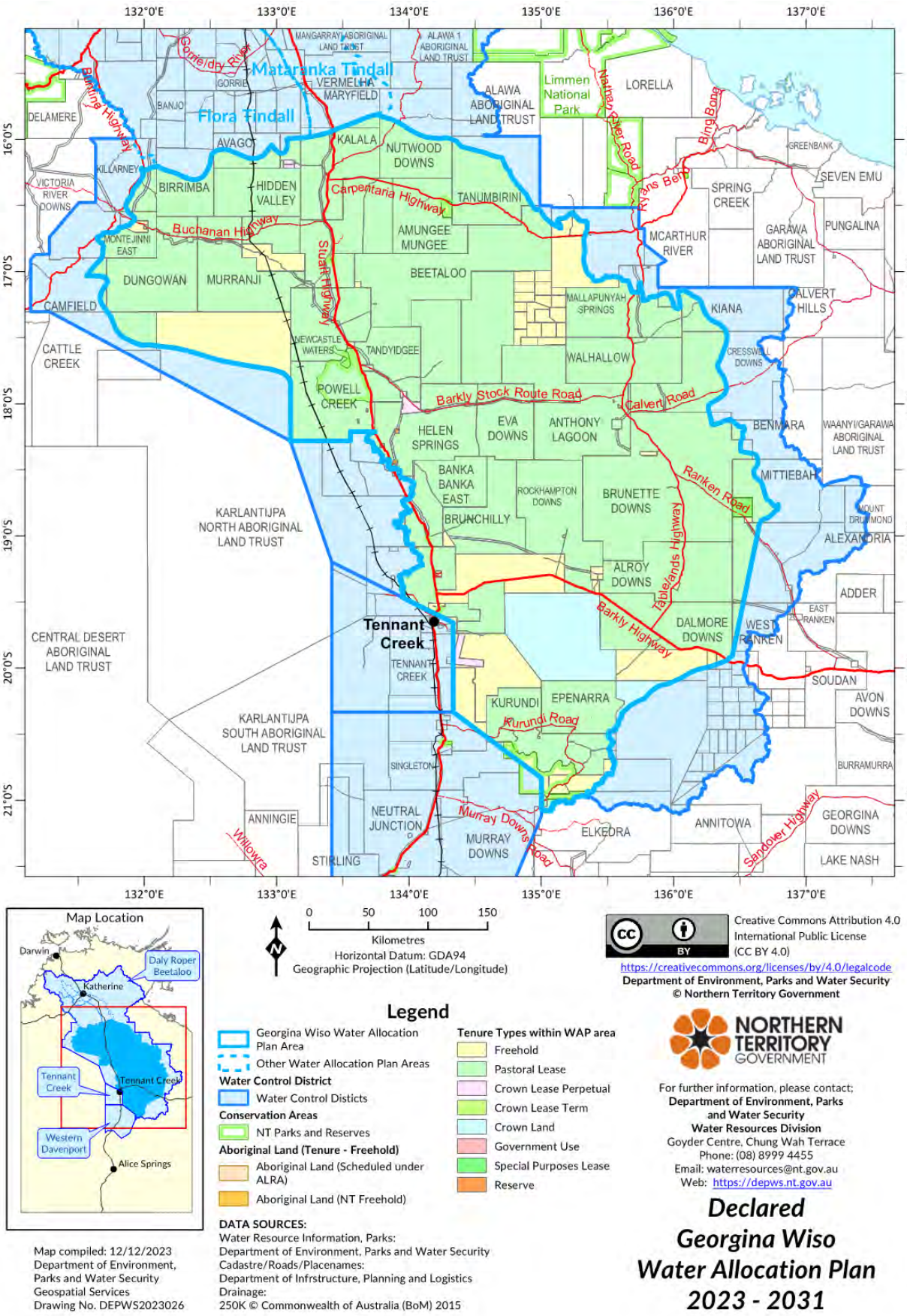


Figure 5-3 Declared Georgina Wiso Water Allocation Plan area

Source: DEPWS (2023h; 2023i; 2023j). Creative Commons licence.

Mataranka Tindall Limestone Aquifer Water Allocation Plan

A water allocation plan is also currently being prepared for the Tindall Limestone Aquifer in the region surrounding Mataranka (DEPWS, 2023k).

The water allocation plan is within the Daly Roper Beetaloo Water Control District. The plan area is shown in Figure 5-4.

The Tindall Limestone Aquifer sustains the springs of Elsey National Park, Rainbow and Bitter springs, dry-season flows in the Roper River, cultural and spiritual values, as well as a range of other industries (DEPWS, 2023k).

Previously, a draft water allocation plan was established for this water resource. The existing draft plan boundary is now being expanded southward from Mataranka to encompass the Tindall Limestone Aquifer in the Larrimah area. An assessment of land and water suitability was conducted in this area, identifying suitable land for irrigated agriculture that can be supplied with water from the Tindall Limestone Aquifer. The extension of the plan boundary aims to ensure that water allocation planning in the region considers both present and future development, while safeguarding other valuable water uses within the area (DEPWS, 2023k).

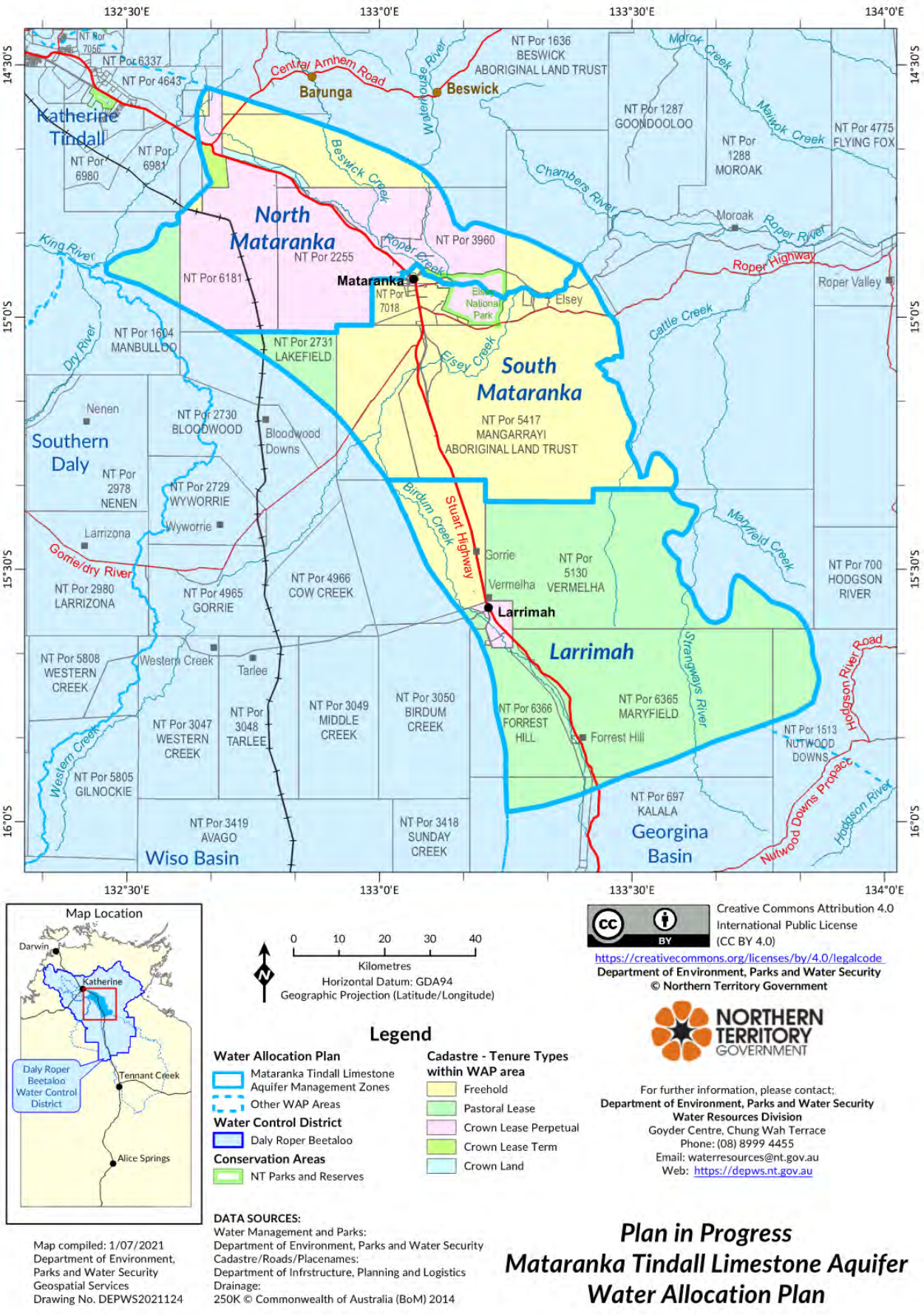


Figure 5-4 Proposed Mataranka Tindall Limestone Aquifer Water Allocation Plan area

Source: DEPWS (2021e). Creative Commons licence.

Flora Tindall Water Allocation Plan

Pre-planning activities for the Flora Tindall Water Allocation Plan have only recently commenced. Plan development and appointment of a water advisory committee are scheduled for 2023 (DEPWS, 2023l).

5.4 Water licensing

Water extraction licences

Water extraction licenses are necessary when extracting groundwater or surface water for purposes other than rural stock and domestic use. These licenses are valid for a duration of up to 10 years and include conditions specifying the maximum allowable volume of water that can be extracted annually and seasonally. Additionally, license holders may be required to measure and report the amount of water taken as per the license conditions (DEPWS, 2022a).

The Processing Water Extraction Licence Applications policy (DEPWS, 2020a) provides guidance on the water licence application and assessment processes (DEPWS, 2023f). The policy:

- *clarifies that a licence application must be complete before assessment commences (an accepted application)*
- *outlines the processes that the department will follow in processing licence applications*
- *differentiates between simple proposals and significant applications and the information requirements and assessment processes for each*
- *clarifies what changes constitute an amendment to a licence application and what changes require a new licence application to be submitted*
- *clarifies the order in which licence applications will be assessed and in what time frames*
- *provides a guide to the Water Act s 90(1)(k) factors that will be considered by the Controller in determining licence applications* (DEPWS, 2020a).

The policy applies to new surface water or groundwater extraction licence applications. It also applies if it is proposed to increase an existing water extraction licence's maximum annual entitlement. In Alice Springs and Daly / Roper River water control districts, a groundwater extraction licence is not needed if less than 5 ML of groundwater is to be used on a property each year (DEPWS, 2021f).

A water extraction licence application may either be a simple proposal or a significant application. Simple proposals are defined by the policy as applications for water extraction licences that are:

- *seeking less than 500 ML outside a water allocation plan area*
- *seeking less than 10% of the general consumptive pool in a water allocation plan area*
- *not within 1 km of a GDE protection zone or wetland and*
- *not within a groundwater discharge protection area* (DEPWS, 2020a).

Water extraction licence applications that do not meet the criteria for simple proposals are considered to be a significant application and require more supporting information and involve mor complicated assessment requirements than simple proposals (DEPWS, 2020a).

Applicants must provide evidence that they have taken into account the potential risks to significant GDEs when applying for groundwater extraction. If significant GDEs are present, the application should include details on how the risks to those ecosystems will be managed over time. The proposed management actions should align with any protection measures specified for GDEs in the relevant water allocation plan (DEPWS, 2021f).

Applications must also identify what other relevant permits or approvals have been provided or are required and their status including, for example, planning approvals, clearing permits, mining or petroleum activity approvals and NPU permits (DEPWS, 2021f).

Head or sub-water licences

A head licence is a water extraction licence for a development precinct. Under a head licence, water can be transferred to sub-licence holders. Most activities (except mining and petroleum activities) that are permitted under a water extraction licence may be undertaken under a head licence (NT Govt, 2023o).

The Controller assesses applications under the Water Act, the Northern Territory Water Allocation Planning Framework and the Processing Water Extraction Licences Applications policy. For a head licence, the Controller will assess the precinct development's total water requirements and impacts of water extraction. The Controller also considers the environmental and cultural values in line with the Act, framework and policy (NT Govt, 2023o).

The holder of a head licence can apply to transfer or trade water to an operator in a precinct through a sub-licence without an assessment or notice period. Sub-licence activities must be consistent with activities in the head licence application. Water under a head licence may only be traded permanently within the development precinct (NT Govt, 2023o).

Staged water extraction licences

The Staged Water Extraction Licence Guidelines (DEPWS, 2021g) describe the application of staged water extraction licences in the NT (DEPWS, 2023f).

These guidelines apply to licence applications where:

- *the application is a significant licence application, that is, the application is for more than 3000 ML/year or 30% of the consumptive pool and has a projected time frame for development of more than 5 years*
- *there is limited development in the area and the behaviour of the water resources is not fully tested over the long term*
- *the project is a greenfield project or an expansion of an existing operation that will have different annual water requirements at different intervals or stages of the project*
- *the water allocated under a licence is required to support a detailed project development plan that is expected to take more than 5 years to deliver* (DEPWS, 2021g).

Staged water extraction licenses provide assurance to a project by guaranteeing the availability of water entitlements from the initial development phase until the project reaches its full potential. These licenses incorporate specific conditions that restrict water allocations based on the project's

progress in achieving milestones outlined in the project plan, and also take into consideration environmental protection standards, where applicable. A project may not progress until approval from the Controller is obtained after considering whether licence entitlements are being used as intended, the water resource is behaving as expected and the water resource is being managed in accordance with the licence (DEPWS, 2021g).

Water discharge licences

Under the Water Act, the Controller is authorised to grant waste discharge licences (WDLs) that allow for the discharge of waste or pollution into any type of water, whether it is flowing, contained, tidal or groundwater. The Controller is assisted by the Environment Division of the Department in making WDL decisions. WDLs come with conditions that guarantee the protection of the receiving environment. These conditions often require compliance with environmental performance standards, as well as monitoring and reporting obligations to enhance understanding of the activity's impact on the receiving environment (DEPWS, 2022a).

Announced allocations – Roper River and Mataranka Tindall Limestone Aquifer

Announced allocations are specified in the conditions of groundwater extraction licences granted to take water from bores in the Mataranka Tindall Limestone Aquifer and surface water extraction licences granted on the Roper River. They are volumes of water that are announced that limit how much water may be taken within a set period and seek to maintain an appropriate level of environmental protection and water supply security associated with the water resource from which licensed extraction occurs (Controller of Water Resources, 2021).

The integrated surface water – groundwater model of the Roper catchment is utilised to evaluate the potential effects on river flows over the course of a water allocation year. Potential impacts are assessed by analysing the differences between the naturally modelled daily flows and the altered modelled daily flows that result from the combined impacts of water extractions from both the Roper River and the Mataranka Tindall Limestone Aquifer.

6 Environmental assessment considerations

The previous sections have examined the importance of investors and developers understanding land tenure types as well as the water allocation and management requirements that apply in the NT. This section summarises how managing environmental impacts is a third key regulatory consideration impacting how land and water developments must be planned, designed and operated.

6.1 Environmental impact assessments and approvals

The EIA and approval framework is established by the Environment Protection Act and the *Environment Protection Regulations 2020* (NT). The purpose of the EIA and environmental approval system in the NT is to:

> *ensure there is no unacceptable impact on the environment resulting from actions, now or in the future.* (DEPWS, 2022a)

The assessment of impacts is carried out by the NT EPA with the support of DEPWS. The NT EPA is obliged to evaluate a proposal that has the potential to significantly affect the environment and provide a recommendation to the Environment Minister regarding the approval or refusal of an environmental approval (DEPWS, 2022a). The provisions of the Environmental Protection and Biodiversity Conservation (EPBC) Act also apply as discussed Section 6.4.

An EIA is carried out by the NT EPA on behalf of the Northern Territory Government for all proposed actions that are expected to have a significant impact. Following this, the Minister makes a final decision on whether to approve the proposal or not, with any relevant conditions. DEPWS is responsible for monitoring compliance with the conditions of the approval. It also has enforcement powers and can act in the event of a non-compliance (DEPWS, 2020e).

If an EIA is deemed necessary by the NT EPA, it is also responsible for determining the assessment methodology to be used. It must consider:

- *the significance of the potential impact*
- *the level of confidence in the prediction of potential significant impacts*
- *the level of confidence in the effectiveness of proposed measures to avoid, mitigate or manage potential significant impacts*
- *the extent of community engagement that has occurred on the action*
- *the capacity of communities and individuals (likely to be affected by the project) to access and understand information about the project (the adequacy and appropriateness of consultation with potentially impacted members of the public)* (DEPWS, 2020e).

There are four tiers of assessment (or assessment methodologies):

1. *Assessment on referral information – where the NT EPA is able to prepare an assessment report based on the original referral and any additional information and submissions provided as part of the acceptance of the referral.*

2. *Assessment on supplementary environmental report – where the NT EPA is able to prepare an assessment report based on the original referral, any additional information and submissions provided as part of the acceptance of the referral, and a supplementary report that provides additional information in relation to specific aspects of potential significance.*
3. *Assessment by environmental impact statement – where the NT EPA requires an environmental impact statement that addresses approved terms of reference.*
4. *Assessment by inquiry – where the NT EPA, or a panel appointed by the NT EPA, will undertake an inquiry that addresses approved terms of reference.* (DEPWS, 2020e)

As per the Environment Protection Act, the Minister is responsible for granting or denying environmental approvals, with guidance from the NT EPA. After receiving input from the NT EPA, the Minister has 30 business days to either grant or deny the environmental approval. If a decision is not reached within this time frame, the NT EPA's advice is regarded as the approval determination (DEPWS, 2020e).

6.2 Environmental protection approvals and licences

The *Waste Management and Pollution Control Act 1998* (NT) (WMPC Act) requires an environment protection approval or licence from the NT EAP for constructing, installing or carrying out works on a premises, and operating that premises in relation to:

- *disposing of waste by burial*
- *storing, recycling, treating or disposing of a prescribed hazardous waste on a commercial or fee-for-service basis (apart from a sewage treatment plant)*
- *processing hydrocarbons to produce, store and/or despatch liquefied natural gas and/or methanol (more than 500,000 t annually and is not regulated under the Northern Territory* Petroleum Act 1984*).* (DEPWS, 2022a)

The WMPC Act does not stipulate specific time frames for approval decisions. However, approvals and licences are typically issued within 95 days of receiving the application. For less complex cases, approvals and licences may be issued within 35 days (DEPWS, 2022a).

6.3 Environment Management Plans

According to the *Petroleum (Environment) Regulations 2016* (NT), any onshore petroleum activity must adhere to an approved environment management plan (EMP).

An EMP is the key document that regulates onshore petroleum activities with potential environmental impacts in the NT. The Minister for Environment, Climate Change and Water Security is responsible for approving EMPs based on assessments undertaken by DEPWS. The allowable time frame to decide an EMP is 90 days (DEPWS, 2022a).

6.4 Environmental Protection and Biodiversity Conservation Act

The EPBC Act is the Australian Government's key environmental legislation that includes:

- an environmental assessment regime which essentially requires a person to not take an action that would significantly impact on a matter of national environmental significance. These matters, and an assessment and approvals process, are set out in the EPBC Act
- a biodiversity conservation regime which includes provisions and processes related to nationally threatened species and ecological communities, key threatening processes and World Heritage properties, National and Commonwealth Heritage places, Ramsar wetlands and Commonwealth reserves.

7 Coordinating development processes

Clearly, land tenure type, water management arrangements and environmental impact requirements collectively present multiple challenges for investors and developers who may be new to the NT. This complexity is acknowledged by the NT Government and its agencies. This section outlines two initiatives that are underway to assist developers in understanding how these various requirements might apply to particular proposals.

7.1 DEPWS development coordination role

DEPWS offers assistance in coordinating development to proponents, aiding them in obtaining any necessary environmental regulatory approvals that may be necessary for the development of their project (DEPWS, 2023m).

The department has implemented a Regulatory Efficiency Program to streamline and expedite environmental and natural resource approvals, while maintaining the necessary level of assessment rigor. The Development Coordination Branch serves as a single point of contact for proponents seeking departmental assistance with their development proposals. The branch officers assist proponents in identifying which departmental divisions can provide assistance and which approvals are required for their specific projects. They also arrange meetings between proponents and relevant departmental officers, to facilitate access to relevant advice and information (DEPWS, 2023m).

The branch is currently mapping approval processes and time frames for a number of example projects. This will show proponents the approvals required for a variety of project types (DEPWS, 2023m).

7.2 Approvals mapping

As the size and scale of projects increase, along with the need to evaluate significant impacts under the Environment Protection Act, the role and importance of regulations such as the Petroleum (Environment) Regulations, the Water Act and the Pastoral Land Act become less straightforward. To address this issue, DEPWS is conducting a regulatory mapping project to clarify the referrals under the Environment Protection Act and the circumstances under which EIA can be used instead of or in conjunction with the specific assessment and decisions outlined in other legislation. The primary objective is to identify and streamline redundant and duplicate procedures while ensuring environmental outcomes are achieved (DEPWS, 2022a).

The Director Development Coordination is presently working on mapping out the regulatory approval procedures for various types of projects (such as mines, large-scale horticultural projects, etc.) which come under DEPWS's purview. This task involves creating flowcharts and guidance materials that outline different stages and timelines associated with the approval of a range of specific scenarios, with the aim of helping both proponents and the government to better

understand and navigate NT's environmental and natural resource approval processes (DEPWS, 2022a).

This mapping exercise, once completed, will offer useful guidance for proponents of new developments in the Roper catchment.

8 Concluding remarks

This case study illustrates how three key pillars of regulatory considerations – land tenure, water allocation and management arrangements and environmental approvals – collectively influence the type, design, extent, timing and location of a land and water development proposal in the NT.

Although land and water resources may appear to be abundant in the NT, this impression belies the rich yet complex nature of the landscape, its waters, its climate and its peoples.

It is important for investors and developers of NT's land and water resources to understand the range and implications of the regulatory considerations examined in this case study to enable new opportunities to be progressed in a sustainable, planned and collaborative way. Opportunities exist for proponents to reach out to NT Government agencies specifically set up to achieve this by assisting in the navigation of its regulatory arrangements.

References

AIATSIS (2016) Native title information handbook : Northern Territory / Australian Institute of Aboriginal and Torres Strait Islander Studies. Native Title Research Unit. Viewed 24 January 2024, https://aiatsis.gov.au/sites/default/files/research_pub/native_title_information_handbook_2016_nt_2.pdf.

ALC (2023) Our Vision, Mission and Values. Viewed 29 March 2023, https://anindilyakwa.com.au/our-vision-mission-and-values/.

AustLii (2023) Aboriginal Land Rights (Northern Territory) Act 1976 - SECT 23 Functions of Land Council. Viewed 29 March 2023, http://www6.austlii.edu.au/cgi-bin/viewdoc/au/legis/cth/consol_act/alrta1976444/s23.html.

Badu Advisory (2023) Review of the NT's implementation of the National Water Initiative in relation to water planning. Unpublished draft.

CLC (2023) Leasing and licensing Aboriginal land. Viewed 29 March 2023, https://www.clc.org.au/leasing-and-licensing-aboriginal-land/.

CLC and NLC (2020) Submission to the Productivity Commission Draft Report into Resources Sector Regulation. Viewed 24 January 2024, https://www.pc.gov.au/__data/assets/pdf_file/0005/255668/subdr079-resources.pdf.

Controller of Water Resources (2021) 2021 Announced Allocation - Roper River Region. Viewed 24 January 2024, https://depws.nt.gov.au/__data/assets/pdf_file/0011/1000217/aaa-2021-2022-mataranka-roper-river-region-decision.pdf.

DENR (Undated) Recovery of unused water fact sheet. Viewed 29 March 2023, https://depws.nt.gov.au/__data/assets/word_doc/0003/918327/recover-unused-water-fact-sheet.docx.

DENR (2020) Northern Territory Water Allocation Planning Framework. Viewed 24 January 2024, https://depws.nt.gov.au/__data/assets/pdf_file/0011/476669/nt-water-allocation-planning-framework.pdf.

DEPWS (2020a) Processing Water Extraction Licence Applications policy. Viewed 29 March 2023, https://depws.nt.gov.au/__data/assets/pdf_file/0007/901618/processing-wel-applications-01072020.pdf.

DEPWS (2020b) Trading Licensed Water Entitlements Policy. Viewed 24 January 2024, https://nt.gov.au/__data/assets/pdf_file/0005/1299533/trading-licensed-water-entitlements-policy.pdf.

DEPWS (2020c) Recovery of Unused Licensed Water Entitlements Policy. Viewed 24 January 2024, https://nt.gov.au/__data/assets/pdf_file/0010/1299853/recovery-of-unused-licensed-water-entitlements-policy.pdf.

DEPWS (2020d) Procedure: Recovery of Unused Licensed Water Entitlements. Viewed 24 January 2024, https://nt.gov.au/__data/assets/pdf_file/0011/1299854/recovery-of-unused-licensed-water-entitlements-procedure.pdf.

DEPWS (2020e) Environmental impact assessment and environmental approval in the Northern Territory. Viewed 24 January 2024, https://depws.nt.gov.au/__data/assets/pdf_file/0003/816906/Guide-to-the-NT-environmental-impact-assessment-and-approval-process.pdf.

DEPWS (2021a) Wildman Agricultural Precinct. Viewed 30 March 2023, https://depws.nt.gov.au/land-resource-management/development-coordination/project/northern-territory-land-corporation-agricultural-precincts/precincts-pages/wildman-agricultural-precinct.

DEPWS (2021b) Keep Plains Agricultural Development - Approvals Mapping. Viewed 29 March 2023, https://depws.nt.gov.au/land-resource-management/development-coordination/project/northern-territory-land-corporation-agricultural-precincts/precincts-pages/keep-plains-agricultural-development-approvals-mapping.

DEPWS (2021c) Land clearing guidelines Viewed 24 January 2024, https://nt.gov.au/__data/assets/pdf_file/0007/236815/land-clearing-guidelines.pdf.

DEPWS (2021d) Northern Territory Water Allocation Planning Framework. Viewed 29 March 2023, https://depws.nt.gov.au/news/2021/northern-territory-water-allocation-planning-framework.

DEPWS (2021e) Plan in Progress - Mataranka Tindall Limestone Aquifer Water Allocation Plan.

DEPWS (2021f) Form 45/60 - Apply to take water: Water Act 1992 sections 45 and 60. Viewed 24 January 2024, https://nt.gov.au/__data/assets/pdf_file/0008/944783/apply-to-take-water-form.pdf.

DEPWS (2021g) Staged Water Extraction Licence Guidelines. Viewed 24 January 2024, https://depws.nt.gov.au/__data/assets/pdf_file/0004/986359/staged-water-extraction-licence-guideline.pdf.

DEPWS (2022a) Regulatory Efficiency Program - Actions to streamline and accelerate environmental and natural resource approvals. Viewed 29 March 2023, https://depws.nt.gov.au/__data/assets/pdf_file/0014/1111073/regulatory-efficiency-program.pdf.

DEPWS (2022b) Draft Georgina Wiso Water Allocation Plan 2022 2030. Viewed 24 January 2024, https://haveyoursay.nt.gov.au/81019/widgets/389172/documents/245855.

DEPWS (2023a) Northern Territory Land Corporation - Agricultural Precincts. Viewed 29 March 2023, https://depws.nt.gov.au/land-resource-management/development-coordination/project/northern-territory-land-corporation-agricultural-precincts.

DEPWS (2023b) Water Act. Viewed 30 March 2023, https://depws.nt.gov.au/water/legislation/water-act.

DEPWS (2023c) NT Controller of Water Resources. Viewed 29 March 2023, https://depws.nt.gov.au/water/legislation/nt-water-controller.

DEPWS (2023d) Exemptions under the NT Water Act 1992. Viewed 29 March 2023, https://depws.nt.gov.au/water/legislation/exemptions.

DEPWS (2023e) Water allocation policies. Viewed 29 March 2023, https://depws.nt.gov.au/water/policy/water-allocation-policies.

DEPWS (2023f) Water licensing policies. Viewed 29 March 2023, https://depws.nt.gov.au/water/policy/water-licensing-policies.

DEPWS (2023g) About water allocation planning. Viewed 30 March 2023, https://depws.nt.gov.au/water/water-management/water-allocation-plans/about-water-allocation-planning.

DEPWS (2023h) Georgina Wiso Water Allocation Plan. Viewed 30 March 2023, https://depws.nt.gov.au/water/water-management/water-allocation-plans/planning-for-the-georgina-basin?SQ_VARIATION_1117062=0.

DEPWS (2023i) Declared Georgina Wiso Water Allocation Plan area. Viewed 18 December 2023, https://nt.gov.au/environment/water/management-security/water-control-districts/daly-roper-beetaloo/planning-for-the-georgina-basin.

DEPWS (2023j) Draft Georgina WISO Water Allocation Plan area. Viewed 24 January 2024, https://www.ntlis.nt.gov.au/mpds/get_file?file_id=9642.

DEPWS (2023k) Mataranka Tindall Limestone Aquifer Water Allocation Plan. Viewed 30 March 2023, https://depws.nt.gov.au/water/water-management/water-allocation-plans/tindall-mataranka-daly-waters-water-allocation-plan.

DEPWS (2023l) Planning for the Flora. Viewed 30 March 2023, https://depws.nt.gov.au/water/water-management/water-allocation-plans/planning-for-the-flora.

DEPWS (2023m) Development coordination. Viewed 30 March 2023, https://depws.nt.gov.au/land-resource-management/development-coordination.

DIPE (2002) NT pastoral districts map https://depws.nt.gov.au/__data/assets/pdf_file/0005/269303/ntpastoraldistricts.pdf.

EDO (2022) Planning and development laws in the NT. Viewed 24 January 2024, https://www.edo.org.au/wp-content/uploads/2022/05/220429-Planning-and-development-laws-in-the-NT.pdf.

Faulks J (2001) An Assessment of the Physical and Ecological Condition of the Roper River and its Major Tributaries. Viewed 24 January 2024, https://catalogue.nla.gov.au/catalog/3546146.

NIAA (2023) Native title representative bodies and service providers. Viewed 29 March 2023, https://www.niaa.gov.au/indigenous-affairs/land-and-housing/native-title-representative-bodies-and-service-providers.

NNTT (2023) Representative Aboriginal/Torres Strait Islander Body Areas.

NT Govt (2017) Strategic Aboriginal Water Reserve Policy Framework. Viewed 24 January 2024, https://depws.nt.gov.au/__data/assets/pdf_file/0011/457553/SWRC-Policy-Framework_A4_V1.pdf.

NT Govt (2022) The Territory's Economic Reconstruction - Progress Report 3. Viewed 24 January 2024, https://invest.nt.gov.au/__data/assets/pdf_file/0005/1284125/the-territorys-economic-reconstruction-progress-report-3.pdf.

NT Govt (2023a) Land tenure and availability. Viewed 29 March 2023, https://nt.gov.au/industry/mining-and-energy/land-tenure-and-availability.

NT Govt (2023b) NT freehold land. Viewed 29 March 2023, https://nt.gov.au/industry/mining-and-energy/land-tenure-and-availability/nt-freehold-land.

NT Govt (2023c) Aboriginal freehold land. Viewed 29 March 2023, https://nt.gov.au/industry/mining-and-energy/land-tenure-and-availability/aboriginal-freehold-land.

NT Govt (2023d) Exploration on Aboriginal freehold land. Viewed 29 March 2023, https://nt.gov.au/industry/mining-and-energy/land-tenure-and-availability/aboriginal-freehold-land/exploration.

NT Govt (2023e) Pastoral land. Viewed 29 March 2023, https://nt.gov.au/industry/mining-and-energy/land-tenure-and-availability/pastoral-land.

NT Govt (2023f) Native title. Viewed 29 March 2023, https://nt.gov.au/industry/mining-and-energy/land-tenure-and-availability/native-title.

NT Govt (2023g) Soil and Land Suitability Assessment for Irrigated Agriculture in the Larrimah Area, Sturt Plateau. Viewed 30 March 2023, https://data.nt.gov.au/dataset/soil-and-land-suitability-assessment-for-irrigated-agriculture-in-the-larrimah-area--sturt-plateau.

NT Govt (2023h) Clearing of native vegetation on pastoral land. Viewed 30 March 2023, https://nt.gov.au/property/land-clearing/pastoral-land/clearing-native-vegetation-on-pastoral-land.

NT Govt (2023i) Non-pastoral use of pastoral land. Viewed 30 March 2023, https://nt.gov.au/industry/agriculture/farm-management/non-pastoral-use-of-pastoral-land.

NT Govt (2023j) Planning applications and processes. Viewed 29 March 2023, https://nt.gov.au/property/land-planning-and-development/planning-applications-and-processes.

NT Govt (2023k) Water control districts. Viewed 30 March 2023, https://nt.gov.au/environment/water/water-resources-of-the-nt/water-control-districts.

NT Govt (2023l) Draft Surface Water Take – Wet Season Flows Policy. Viewed 29 March 2023, https://haveyoursay.nt.gov.au/wet-season-flows-policy.

NT Govt (2023m) Apply for a permit to interfere with a waterway. Viewed 30 March 2023, https://nt.gov.au/environment/water/bores-drilling-dams-and-waterways/apply-for-a-permit-to-interfere-with-a-waterway.

NT Govt (2023n) Interference with a Waterway Guideline. Viewed 24 January 2024, https://haveyoursay.nt.gov.au/77026/widgets/371869/documents/231384.

NT Govt (2023o) Apply for a head or sub-water licence. Viewed 29 March 2023, https://nt.gov.au/environment/water/water-licences/apply-for-a-head-or-sub-water-licence.

NTLC (2022) Larrimah Farms developer announced. Viewed 30 March 2023, https://ntlandcorp.com.au/larrimah-farms-developer-announced/.

NTLC (2023a) Our Governance. Viewed 29 March 2023, https://ntlandcorp.com.au/our-governance/.

NTLC (2023b) Our practices and processes. Viewed 29 March 2023, https://ntlandcorp.com.au/our-practices-and-processes/.

Petheram C, Hughes J, Stokes C, Watson I, Irvin S, Musson D, Philip S, Turnadge C, Poulton P, Rogers L, Wilson P, Seo L, Pollino C, Ash A, Webster T, Yeates S, Chilcott C, Bruce C, Stratford D, Taylor A, Davies P and Higgins A (2018) Case studies for the Northern Australia Water Resource Assessment. A report to the Australian Government from the CSIRO Northern Australia Water Resource Assessment, part of the National Water Infrastructure Development Fund: Water Resource Assessments. CSIRO, Australia.

PLBNT (2022a) Pastoral land clearing guidelines. Viewed 24 January 2024, https://nt.gov.au/__data/assets/pdf_file/0003/902289/northern-territory-pastoral-land-clearing-guidelines.pdf.

PLBNT (2022b) Non-pastoral use guidelines. Viewed 24 January 2024, https://nt.gov.au/__data/assets/pdf_file/0005/261950/non-pastoral-use-guidelines.pdf.

Short M, Bond T and Northern Territory. Department of Environment PaWS (2020) Classification of the Top End and Arid Zone for Northern Territory water resources. Viewed 24 January 2024, https://hdl.handle.net/10070/843257.

Taylor AR, Crosbie RS, Turnadge C, Lamontagne S, Deslandes A, Davies PJ, Barry K, Suckow A, Knapton A, Marshall S, Hodgson G, Tickell S, Duvert C, Hutley L and Dooley K (2023) Hydrogeological assessment of the Cambrian Limestone Aquifer and the Dook Creek Aquifer in the Roper catchment, Northern Territory. A technical report from the CSIRO Roper River Water Resource Assessment for the National Water Grid. CSIRO, Australia.

TLC (2023) Statements and Vision. Viewed 29 March 2023, https://www.tiwilandcouncil.com/index.cfm?fuseaction=page&p=164&l=2&id=57&smid=127.

TLC (2023a) Our Governance. Viewed 29 March 2023, https://ntlandcorp.com.au/our-governance/.

As Australia's national science agency and innovation catalyst, CSIRO is solving the greatest challenges through innovative science and technology.

CSIRO. Unlocking a better future for everyone.

Contact us

1300 363 400
+61 3 9545 2176
csiroenquiries@csiro.au
csiro.au

For further information

Environment
Dr Chris Chilcott
+61 8 8944 8422
chris.chilcott@csiro.au

Environment
Dr Cuan Petheram
+61 467 816 558
cuan.petheram@csiro.au

Agriculture and Food
Dr Ian Watson
+61 7 4753 8606
ian.watson@csiro.au